



2022-2023

NATIONAL YOUTH SCIENCE FORUM ANNUAL REPORT 2022-2023

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National Youth
Science Forum

This report is for the financial year 1
April 2022 to 31 March 2023 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

The National Youth Science Forum (NYSF) takes pride in nurturing a community of over 15,000 alumni through our flagship NYSF Year 12 Program. In 2023, we united 451 NYSF Year 12 Program participants from diverse corners of Australia, offering them rich exposure to real life STEM people and jobs in science and technology.

Our commitment to inclusivity was evident with 61% of our participants identifying as women and 41% from regional and remote areas. Thanks to our partners and donors, we were able to grant an unprecedented 98 NYSF Access and Equity Scholarships, providing access for students who wouldn't otherwise have had this experience.

Adapting to the challenges posed by the pandemic, the NYSF Year 12 Program continued as a blended learning experience, combining an immersive digital program with carefully curated state-based in-person STEM Hubs.

In keeping with our vision to be a leader in connecting young Australians with diverse science and technology futures, the year has included planning of the pilot of the NYSF National Youth STEM Summit to be held in Canberra in mid-2023. We have also focussed on engaging our alumni in opportunities, streamlining operations, and maintaining and securing our valued partnerships.

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

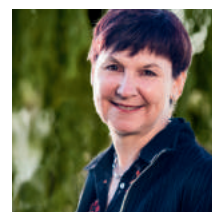
Thank you to our Rotary and Student Staff Volunteers for their unwavering support, passion and the many hours you give to supporting the NYSF. We also thank our supporters, NYSF alumni, and the countless organisations and individuals who generously hosted visits and shared their knowledge. We take great pride in being a collaborator within a robust and supportive network in the STEM sector.

Our sincere appreciation goes to the 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.

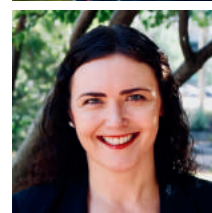
We also acknowledge and thank the Chief Scientist of Australia and the Chief and Lead Scientists in each State and Territory, as well as the State Governors and Administrators throughout the country, for their invaluable support of our programs.

We express our deepest gratitude to the NYSF Board and the NYSF Corporate Team. Their unwavering commitment, passion, and hard work have been instrumental in our achievements.

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 39 years and is one of the best-known STEM experiences in Australia for young people. It has helped over 15,000 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

Inspiring more young Australians to engage in science and technology futures.

PURPOSE

Creating opportunities to inspire and connect young Australians with diverse science and technology pathways.

PROGRAMS IN 2022–2023

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



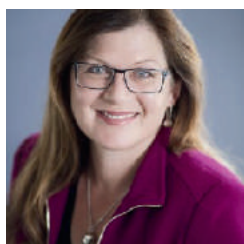
GOVERNANCE

The NYSF is governed by an active Board of Directors. The board comprises ten highly respected and accomplished members of the STEM sector and business community, as well as the NYSF CEO. Board members throughout 1 April 2022 to 31 March 2023 were:

BOARD OF DIRECTORS



Chair (until Feb 23)
Kerri Hartland



Deputy Chair (until Feb 23)
Interim Chair (from Feb 23)
The Hon Kate Lundy



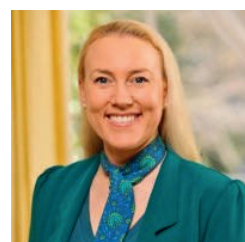
Deputy Chair
Dr Geoff Garrett AO



Secretary
Sally Vardy GAICD



Finance Director
Bruce Hunter



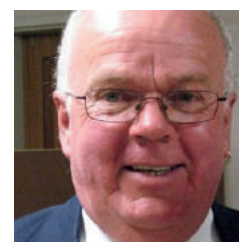
Alumni Director
Colonel Dr Renée
Kidson CSM



Ordinary Director
Patricia Kelly PSM
GAICD



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 DSC (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 maintains close connections and relationships with numerous organisations across Australia. This network allows the NYSF to present captivating opportunities to our participants throughout the year that inspire and nurture them along their STEM journeys.

The impact of the initiatives and programs offered by the NYSF would not be possible without the unwavering support of our many partners, sponsors, and supporters. Our heartfelt appreciation extends to those organisations and individuals that have opened their laboratories and workplaces to our participants throughout 2022–2023. We thank them for offering their time, expertise, and passion for STEM.

We thank our founding partner, Rotary, for being an indispensable pillar of support to the NYSF and our participants throughout the year. Their efforts in conducting student selections and offering in-program assistance to NYSF Year 12 Program participants are invaluable.

Finally, we thank our wonderful NYSF Staff and alumni volunteers. In particular, we'd like to acknowledge our Student Staff Leaders who help to provide enriching experiences for our NYSF participants and their exceptional support of the NYSF as an organisation.



It was an incredible experience which not only allowed me to learn so many new things about areas of STEM I had never before considered, but also to make new, like-minded friends. It allowed me to see many different career options and to learn so much about science and STEM in general.

- 2023 NYSF Participant





OUR PARTNERS

We are immensely grateful to our many partners. Your financial and strategic support have been pivotal in empowering young minds and nurturing their passion for STEM. Your dedication to providing opportunities for the next generation of scientists has bolstered Australia's future STEM workforce and ignited a brighter future for countless young people.

We want to thank you for standing by our side during the challenging times brought on by the COVID-19 pandemic. Your support has been immense and has enabled us to adapt our programs to continue fulfilling our purpose and vision. As we transition back to in-person programs and events, we welcome your ongoing support and thank you in advance for your time and effort.

We'd particularly like to thank Lockheed Martin Australia (LMA) for their continued support of NYSF Programs and the organisation as a whole.

Between 1 April 2022 to 31 March 2023, NYSF also welcomed new partnerships with:

- GHD Foundation
- Organon
- Government of South Australia (Department for Education)

We thank them for their commitment to the NYSF, and look forward to continuing working together to have a positive impact on young people in STEM.



MAJOR FUNDING PARTNERS



HOST UNIVERSITIES



CORPORATE AND GOVERNMENT PARTNERS



UNIVERSITY PARTNERS



SUPPORTING ORGANISATIONS



2023 NYSF YEAR 12 PROGRAM

This National Youth Science Forum (NYSF) Annual Report summarises the impact of the NYSF programs and highlights our participants' experiences. Due to the uncertainty around the pandemic in early 2022, the NYSF continued with a COVID-safe mode of delivery for 2023, which included online delivery and non-residential in-person state STEM Hubs in seven locations, plus a digital Hub. The program helped 451 young Australians from diverse backgrounds discover their STEM futures.

WHO'S INVOLVED



451 PROGRAM PARTICIPANTS

were selected from 289 schools across Australia



52 STUDENT STAFF LEADERS

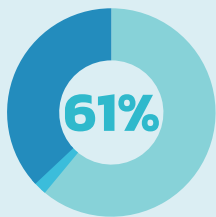
provided youth stewardship of the program



17 ROTARY DISTRICTS

across Australia delivered student selections and volunteered 20,000+ hours

PROGRAM SNAPSHOT



of participants identified as female
(2% gender-diverse)



233,000

Total reach and impressions across NYSF social media platforms in January



41%

of participants were from remote, rural or regional Australia

8



STEM Hubs around Australia in Adelaide, Brisbane, Canberra, Melbourne, Newcastle, Perth, Sydney and Digital.

200



STEM professionals involved in 122 in-person visits around Australia and 33 online sessions

98



Program participants were awarded an NYSF Access and Equity Scholarship (22%)

NYSF ACCESS AND EQUITY SCHOLARSHIPS

A record 98 NYSF Access and Equity Scholarships (22% of participants), totalling almost \$83,000, were awarded to assist students from disadvantaged backgrounds to attend the 2023 NYSF Year 12 Program.

NYSF Access and Equity Scholarships were made possible thanks to generous funding from:

- The Australian Government Department of Industry, Science and Resources,
- The Government of Western Australia Department of Jobs, Tourism, Science and Innovation,
- The Office of the NSW Chief Scientist and Engineer, and
- donations from generous members of the NYSF alumni community.

The SA Department for Education also provided scholarships for three South Australian students to attend the program.



I was extremely grateful to receive not only Rotary funding, but also an NYSF Access and Equity Scholarship. It allowed me to attend the in-person hub in Brisbane, which I might not have otherwise been able to, traveling from Townsville. It allowed me to experience the program more fully and I am extremely grateful to receive all of this support.

- 2023 Scholarship Recipient



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.

80%

of students said NYSF expanded their options or changed their choices for study in STEM. 17% said it confirmed their choices

9.2

9.2/10 average rating from program participants as to how likely they would be to recommend the program to others

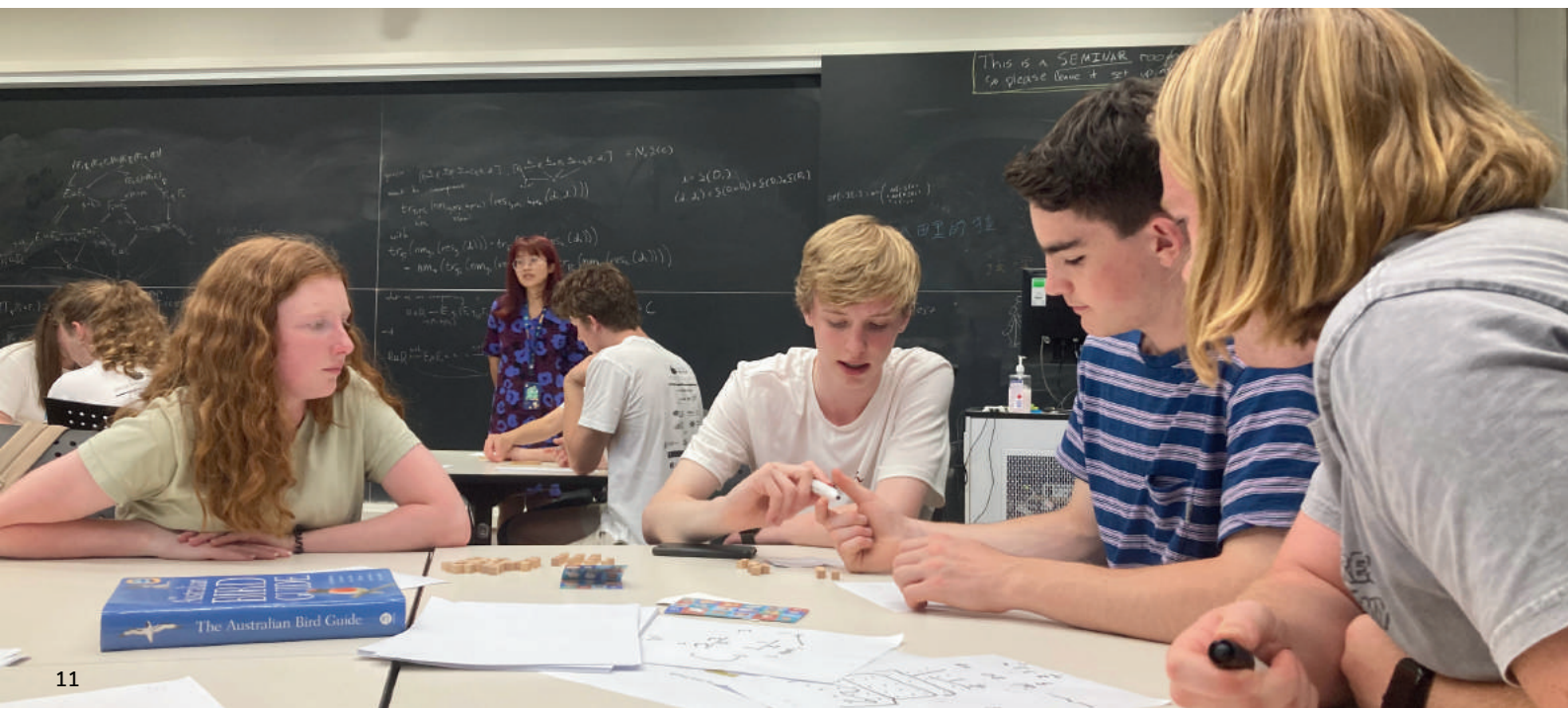
96%

of NYSF Year 12 Program participants plan to pursue further study in a STEM-related field

“

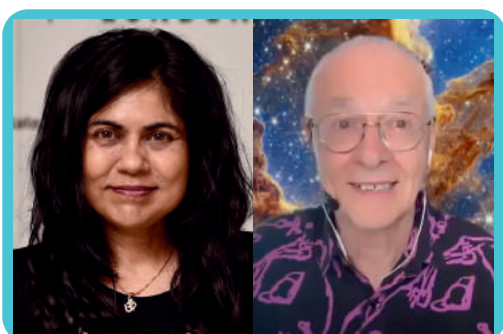
The NYSF was a fascinating and eye-opening experience into the modern world of science and the many diverse career pathways in STEM. As someone from a small town, seeing real-world projects, touring universities and talking to today's leaders in STEM was invaluable to me deciding which pathway I'm passionate about taking.

NYSF Participant, 2023





PROGRAM HIGHLIGHTS



KEYNOTE SPEAKERS

Professor Veena Sahajwalla FAA FTSE
and Dr Karl Kruszelnicki AM



IN-PERSON HUB VISITS

NYSFers visited universities and STEM
organisations at seven state STEM Hubs
around Australia.



LIVE CROSSES

We beamed live to the world's best
STEM facilities including the RV
Investigator, Antarctic stations, and
CERN in Switzerland.



STEM CHALLENGES

Students collaborated on two challenges;
finding solutions for local waste issues,
and creating a STEM podcast for Cosmos!

STEM HUBS SUMMARY

In-person STEM Hubs were run in capital cities across the country in January 2023. We saw NYSFers attend and participate in a diverse range of sensational STEM visits, workshops, and social events.

Canberra | visits took place at The Australian National University, ANU Earth Sciences, ANU Department of Nuclear Physics and Accelerator Applications, ANU Effective Altruism, ANU Mathematical Sciences Institute, ANU College of Engineering, Computing & Cybernetics (CEC), ANU Solar Car Racing, ANU OzGrav and Dark Matter Centre, ANU Chemistry, ANU ASTRO 3D and Research School of Astronomy and Astrophysics at Mount Stromlo, ANU Formula Sport, ANU School of Cybernetics, ANU Biology, ANU Fenner School of Environment and Society, ANU Eccles Institute of Neuroscience, Australian Defence Force Drone Racing, Geoscience Australia, Wildbark Visitor Centre, Academy of Interactive Entertainment (AIE), CSIRO Canberra, Australian Signals Directorate, ANU Co-Lab, Department 13 Drone Technology, Questacon, and the Nature Art Lab.

Brisbane | visits took place at The University of Queensland, UQ Faculty of Engineering Architecture and Information Technology (EAIT), UQ's Australian Institute for Bioengineering and Nanotechnology (AIBN), UQ Centre for Advanced Imaging (CAI), UQ's Biology Summer School, UQ Cyber Security, UQ Superconducting Quantum Devices Lab, UQ Centre for Microscopy and Microanalysis (CMM), UQ Institute for Molecular Biosciences, UQ Earth Sciences, UQ Integrated Pathology Learning Centre (IPLC), UQ Quantum Optics Labs, Griffith University, and Queensland University of Technology.

Adelaide | visits took place at The University of Adelaide, the Australian Space Discovery Centre, SA Water, ARC Centre of Excellence for Gravitational Wave Discovery, Defence Science and Technology Group (DSTG), The University of South Australia, and Flinders University.



It was very eye-opening and informative, especially about interstate universities that I haven't particularly researched into and now are more aware of possible opportunities.

- 2023 NYSF Participant



All of the staff were incredibly welcoming and enthusiastic when explaining their research and answering our questions. It was amazing to be able to walk through so many working, professional labs and look at the projects/equipment.

- 2023 NYSF Participant

STEM HUBS SUMMARY



“

I loved the fact that we were able to apply science knowledge in a practical activity that was quite challenging. Exactly what I signed up for.

- 2023 NYSF Participant



“

Everyone is so passionate about what they do. I enjoy seeing everything in person and experiencing things I never have before.

- 2023 NYSF Participant

Perth | visits took place at MPL Laboratories (Envirolab), International Centre for Radio Astronomy Research (ICRAR), CSIRO - Australian Resources Centre, Harry Perkins Institute of Medical Research, GHD, Fugro - Australian Space Automation, Artificial Intelligence and Robotics Control Complex (SpAARC), Roy Hill ROC-Ed Learning Centre, Pawsey Supercomputing Research Centre, WA Shipwrecks Museum, The University of Western Australia, Perron Institute for Neurological and Translational Science, Defence Science and Technology Group (DSTG), and Telethon Kids Institute (TKI).

Melbourne | visits took place at Monash University, Defence Science and Technology Group (DSTG), Lockheed Martin STELaRLab, Academy of Interactive Entertainment (AIE), The University of Melbourne, Victorian Space Science Education Centre (VSSEC), Swinburne University - Centre for Astrophysics and Supercomputing, Swinburne University - Dark Matter Centre and Design Factory, Commonwealth Serum Laboratories (CSL), Walter and Eliza Hall Institute (WEHI), Envirolab, Monash/ANSTO - Synchrotron, Peter Doherty Institute for Infection and Immunity, RMIT Virtual Experiences Laboratory/ STEM Centre for Digital Innovation, and RMIT Australian Urban Observatory (AUO).

Sydney and Newcastle | visits took place at The University of New South Wales, Nanosonics, Quantum Brilliance, Academy of Interactive Entertainment (AIE), Museum of Applied Arts and Sciences (Powerhouse), CSIRO Lindfield, Macquarie University, Envirolab, University of Technology Sydney (UTS), 3M Innovation Centre, ANSTO Discovery Centre, The University of Sydney, and The University of Newcastle.

MEDIA COVERAGE

The NYSF was featured in the media five times from 1 April 2022 to 31 March 2023. Media coverage included radio interviews and articles.

2023 NYSF Year 12 Program

2023 NYSF Year 12 Program participant Eliza and Staffie Libby were interviewed on ABC Radio Newcastle. Both spoke about their experiences as participants in the program and noted how life-changing it had been.

NSYF CEO Dr Melanie Bagg and 2022 NYSF Year 12 Program participant Simone were interviewed on ABC Radio Canberra. Dr Melanie Bagg highlighted the wide-reaching impact of the program and its success in reaching a group of diverse young people to empower them to find their future in STEM. Simone spoke about the amazing sense of community at the NYSF and how excited she was for the site visits she was planning to attend as part of the in-person program in Canberra.

The Esperance Weekender wrote a fantastic article celebrating Caleb and Hayden, two successful applicants for the 2023 NYSF Year 12 Program from Esperance Senior High School.

NYSF announces new partnership

In 2022, the NYSF also welcomed a new partner, Organon. Health Industry Hub and Pharma in Focus published articles celebrating this new partnership. Both pieces recognised the impact of this partnership in helping women and young girls achieve their full STEM potential.

[ABC
Newcastle's
story:](#)



[ABC
Canberra's
story:](#)



[Esperance
weekender's
article:](#)



[Health Industry
Hub article:](#)



[Pharma in Focus
article:](#)



It's truly been an incredible experience. When they say it's a once in a lifetime opportunity, it really is. I have learned so much. I'm seeing so much out there in the world of STEM that is there for me.

- Eliza, 2023 NYSF Participant



I really don't know what I wanted to do so the NYSF has been absolutely incredible so far in showing me my options and allowing me to network... It's been such an amazing community, I'm really grateful to have been a part of it so far.

- Simone, 2023 NYSF Participant



DIGITAL PROGRAM HIGHLIGHTS

2023 NYSF Year 12 Program Opening Event

The 2023 NYSF Year 12 Program Opening Event featured a panel of fabulous STEM VIP and NYSF alumni. They gave tips to students to help them make the most out of their NYSF experience and inspired them with stories about their experiences doing incredible things in STEM.

Dr Melanie Bagg GAICD, The Hon Kate Lundy, Air Marshal (Retd) Warren McDonald AO CSC, Dr Sophie Calabretto, Kiowa Scott-Hurley, Justin Kruger, Tara Graves



2023 NYSF
Year 12 Program
Opening Event

A smart vision for a sustainable future: SMaRT technologies and MICROfactories™ creating sustainable materials and products from waste

UNSW Sydney's Professor Veena Sahajwalla FAA FTSE is an internationally recognised materials scientist, engineer and inventor revolutionising recycling science. She joined us for our first keynote address of the 2023 NYSF Year 12 Program.



2023 NYSF
Year 12 Program
Keynote

Science @ home: Measuring the energy output of the sun

Matthew Dodds, science communicator, astronomer, and teacher guided NYSF students through an experiment to measure the sun's energy output using nothing more than a cup of water, a thermometer, a stopwatch and a ruler. They also explored the cooling properties of ice and water that help run cooling systems in various industries.



2023 NYSF
Year 12 Program
Science@Home

Design Thinking Workshop

This problem and customer discovery session, led by Tomas Piccinini from UQ Ventures at The University of Queensland, provided tools and methodologies to create new projects, products and services. Students explored how to identify problems and how to design solutions that are viable and sustainable over time.



2023 NYSF
Year 12 Program
Design Thinking

DIGITAL PROGRAM HIGHLIGHTS



Rotary Session

NYSF Students heard from members of Rotary about the work they do in the community and their passion for encouraging young people like themselves to pursue their interests.

Dr Danielle Stanisis, Tasmia Haque, Anna Ross, Ken Hall



Careers Day

Careers Day gave NYSFers an opportunity to explore a wide range of employment possibilities and hear from people who are making a real impact through their STEM careers. Each of the NYSF's industry partners presented about the work that they do and the opportunities available within their organisations. NYSFers also learnt about a variety of different career paths and STEM journeys.



Careers Day I: Amanda DeDear, Logan Stenlake, Kendall J. and Alex Tolnai from Lockheed Martin Australia Pty Ltd/Lockheed Martin; Alistair Grevis-James from CSL; Lee-Anne Sylva, Taryn H. from GHD; Jayden Inglis and Hilary Schubert-Jones from Defence Science and Technology Group (DSTG); and Julie Mullan and Agnieszka Hayes from Organon ANZ.

Careers Day II: Jillian Matthews from CSIRO; Dr Liz Bridge, Dr Andreas Sawadsky, and David Ryan from Quantum Brilliance; Dr Alison Fowler and Tess Finlen from the WA Government's Department of Jobs, Tourism, Science and Innovation; Dr Nadi Sadr and Liam Holley from ResMed; and Alice Fairey and Brenan Dew from the Australian Space Agency.



Live Q&A with Adam Spencer

NYSFers 'got their geek on' and joined ABC's Adam Spencer! They learnt about Adam's career in Science Communication and his love of maths.

DIGITAL PROGRAM HIGHLIGHTS

STEM Communication Workshop: RiAus and Cosmos

Journalists from RiAus—who produce the science magazine 'COSMOS'—took NYSFers through a science media room and the way they approach the science stories of today and investigated interviews, press releases, podcasting, social media strategy, and climate communication.

Jacinta Bowler, Matthew Agius, Evrim Yazgin, Ellen Phiddian, Ian Mannix, Imma Perfetto



2023 NYSF
Year 12 Program
STEM
Communication
with
RiAus/Cosmos

STEM Communication Workshop: Science friction

NYSFers met CEO of the Australian Science Media Centre, Dr Susannah Elliott and learnt about how she spends her days helping mainstream news journalists cover some of the biggest stories in the news—from climate, energy and natural disasters to diet, health, technology and space.



2023 NYSF
Year 12 Program
STEM
Communication
with AusSMC

Food Security: How agriculture and environment come together

This specialist lecture gave NYSFers a taster of a range of research being done to understand food and agriculture, and the environment and climate and engaged them in a discussion about how these all must come together to ensure sustainable food security.

Dr Rachael Rodney Harris, Leah Moore, Craig Strong



2023 NYSF
Year 12 Program
Specialist
Lecture: Food
Security

Pulse@Parkes, CSIRO Space and Astronomy

During this session, NYSFers used the iconic 64m Parkes radio telescope, Murriyang, remotely. They observed some of the most extreme astrophysical objects known, pulsars, in real-time. They also saw how the telescope is operated, viewed CSIRO's live data stream and were able to discuss insights about study and career options in astronomy.

Rob Hollow, George Hobbs, Dilpreet Kaur, Marcus Lower



2023 NYSF
Year 12 Program
Specialist
Lecture:
Pulse@Parkes

DIGITAL PROGRAM HIGHLIGHTS



Bringing Medicines to Market, proudly supported by Organon

This presentation focused on two of the functions that Medical Affairs perform in the lifecycle of a medication that supports the quality use of medicines.

Cindy Chu, Duncan Purvis



Monitoring Micro Bats, proudly supported by GHD

In this lecture, NYSFers received an insight into an exciting project involving the testing of new scientific methods to monitor a population of the Pilbara Leaf-nosed Bat in the East Pilbara of Western Australia.

Jessie Moyses



Live Cross: CERN

Dr Steven Goldfarb, Dr Muhammad Alhroob and Joni Pham talked to NYSFers from 100 metres underground at the site of the ATLAS Experiment on the Large Hadron Collider at CERN! They showed some of the exciting scientific research happening at CERN, and showed off the detector in an exclusive live tour.



The Science of Sound

NYSFers joined Uncle Brendan Kerin, Macquarie scientists and students from the National Indigenous Science Experience Program, Dolby Australia sound technologist and Questacon presenters in this interactive session on the science of sound. They heard about the importance of sound to Aboriginal cultural practices, how sound happens, and career opportunities that allow you to combine the love of sound and science and technology.

Brendan Kerin, Joanne Jamie, Ian Jamie, Patrick Helean, David Cooper, Kristina Rhee

DIGITAL PROGRAM HIGHLIGHTS

An Underwater Life

Dr Stephanie Gardner shared the experiences that lead her to her marine biology. She talked about the first moments she realised she wanted to work in marine biology, and the steps she took in her career to get there. She shared reflections and advice, including some photos and videos from her research trips around the world.



2023 NYSF
Year 12 Program
Digital Hub:
An Underwater
Life

Life and Death on a Changing Planet

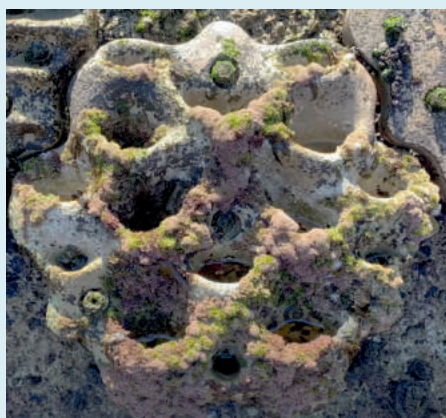
The end-Permian extinction, 252 million years ago, killed off about 95% of all species on the planet. This left a huge gap in Earth's ecosystems, which over time, were filled by new and wondrous species, forming the foundation of the ecosystems we know today. This talk by Dr Espen Knutsen looked at life before and after this extinction, and some ideas around what we can learn from the past.



2023 NYSF
Year 12 Program
Digital Hub:
Life and Death
on a Changing
Planet

Sydney Institute of Marine Science Showcase

NYSFers were joined by SIMS researchers Dr Aria Lee and Dr Cheng Chen to explore some of the research projects undertaken at SIMS. The talk covered their engineering research as well as some information on designing, testing, and implementing solutions to reduce the impact of high thermal stress conditions on the GBR.



2023 NYSF
Year 12 Program
Digital Hub:
Marine Science
Showcase

Adventures at the Bureau of Meteorology

Janet Shelley and Mick Pope took NYSFers behind the scenes at the Bureau to some of Australia's most remote locations - from the inland to the islands to the ice. We looked at the cool equipment used in the field of meteorology, as well as the challenges associated with collecting information in some Australia's most precious and sensitive environments. They discussed graduate opportunities in the Bureau of Meteorology and the exciting career paths NYSFers can take.



2023 NYSF
Year 12 Program
Digital Hub:
Adventures at
the Bureau of
Meteorology

DIGITAL PROGRAM HIGHLIGHTS



National Youth
Science Forum

2023 NYSF Year 12 Program Digital Hub: New Approaches to Conservation

New Approaches to Conservation

By combining areas of STEM seemingly non-combinable, we can look at conservation through a new lens and approach it in new, interesting ways. In this workshop, Dr Jarrod McKenna walked NYSFers through some of the threats the country's flora and fauna face, introduce some of the novel ways STEM professionals are tackling these issues, and call on the NYSFers for some MORE novel ideas.



National Youth
Science Forum

2023 NYSF Year 12 Program Digital Hub: UNSW Digital Field Trip

UNSW Digital Field Trip

In this activity, Dr David Edwards took NYSFers through the relationships between various aspects of the physical environment and the way this interacts with human landscapes through a virtual field trip. Students worked in groups to explore the landscape of part of the Illawarra region at their own pace and in their own way.



National Youth
Science Forum

2023 NYSF Year 12 Program Digital Hub: DSTG Women in STEM Leadership

DSTG Women in STEM Leadership

NYSFers joined Dr Ana Baburamani and Priscilla Thwaites to explore their STEM pathways and how they arrived at the Defence Science and Technology Group (DSTG)!



National Youth
Science Forum

2023 NYSF Year 12 Program Digital Hub: Integrated Pathology and Learning Centre

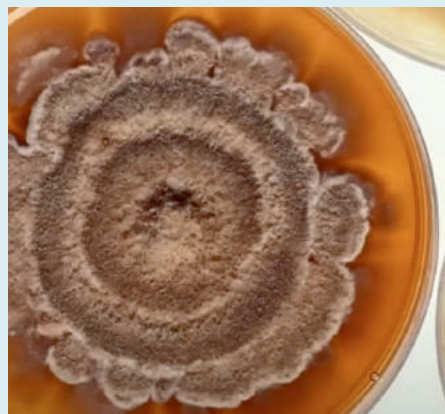
Integrated Pathology and Learning Centre

In this session, NYSFers joined Rebecca Lush, Curator of the Integrated Pathology Learning Centre at The University of Queensland, to increase their understanding of health and disease through seeing real human specimens. They covered an array of topics including heart attacks, smoking, polio, historical surgeries, and genetic conditions.

DIGITAL PROGRAM HIGHLIGHTS

UQ Institute of Molecular Biology

NYSFers met Lily Kenchington-Evans who works on an antimicrobial project in the fields of medicinal chemistry and molecular biology at the University of Queensland's Institute for Molecular Bioscience. They delved into the molecular world and saw what chemistry looks like at the molecular level!



2023 NYSF
Year 12 Program
Digital Hub:
UQ Institute of
Molecular
Biology

How Fish See the World

During this session, Abigail Shaughnessy shows how the vision of coral reef fish is different to humans and is amazingly diverse amongst different species of the reef. She also dives into how different scientific approaches such as molecular, physiology and behaviour, can help us decode how reef fish see their world.



2023 NYSF
Year 12 Program
Digital Hub:
How do Fish See
the World?

University Day

NYSFers discovered a wide range of study and training possibilities from all around Australia during University Day! They heard from each of the NYSF's university partners about the variety of study pathways and options they have available, and what university life is like at their campuses. Following each partner presentation, there was a dedicated Q&A component where they could ask their questions directly to the presenters.

University Day I: Australian National University, University of Queensland, University of New South Wales, University of Melbourne.

University Day II: University of Newcastle, University of Adelaide, Griffith University, Monash University



2023 NYSF
Year 12 Program
University Day I



2023 NYSF
Year 12 Program
University Day II

DIGITAL PROGRAM HIGHLIGHTS



Live Cross: RV Investigator

NYSFers joined Dr Ben Arthur for a look at the nation's bluewater research vessel (RV) Investigator. Live from the ship in Fremantle, They learnt what makes this vessel unique, the amazing array of research that it undertakes, why marine science is so important to Australia, and the diverse career opportunities available.



Live Cross: EV Batteries, Transitioning to a Sustainable Future with Tesla

In this session, NYSFers were joined by NYSF alum and Senior Chemical Process Engineer, Rika Enriga Hobart, to explore how we can close the loop on EV Batteries, accelerating the world's transition to a sustainable future.



Diversity and Inclusion - Women in STEM

In this panel discussion, panellists Kim Hawkins, Dr Sophie Calabretto and Dion Pretorius joined NYSF Staffie Libby to share their experiences, challenges and successes as women in STEM and discussed the important role allies play in the further progression of women in STEM fields.



Diversity and Inclusion - Pride in STEM

NYSFers joined panellists, Dr Erin McGillick and Dr Mohammad Taha in conversation with Staffie Isaac, to celebrate queer science and queers in science. Participants enjoyed discussions of how they've navigated the interaction of identity in their careers and the support and allyship they have received from their communities.

DIGITAL PROGRAM HIGHLIGHTS

The Great Debate

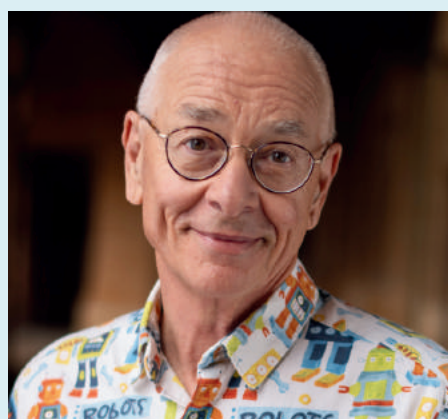
The NYSF Great Debate—for the first time online—focuses on topical issues in science and engineering. Science does not operate in a vacuum, and it is important for participants to consider the implications (some positive, others negative) of science for society. To do so, NYSFers dived into space ethics with Sergeant Amy Hesterman-Crane!



2023 NYSF Year 12 Program The Great Debate

Dr Karl Keynote

NYSFers met one of Australia's most famous science communicators, Dr Karl Kruszelnicki AM! Dr Karl shared his spectacular and diverse STEM journey, and answered questions from NYSF participants.



2023 NYSF Year 12 Program Keynote II

2023 NYSF Year 12 Program Closing Event

Australia's Chief Scientist, Dr Cathy Foley AO PSM, and State Chief and Lead Scientists from across Australia joined us to talk about where STEM is headed in Australia and some of the amazing opportunities on offer across our nation as our NYSFers finish their NYSF Year 12 Program experience and embark on their own STEM journey.



2023 NYSF Year 12 Program Closing Event

Dr Melanie Bagg GAICD, Dr Geoff Garrett AO, Prof Tanya Monro AC FAA FTSE FOSA FAIP GAICI, Dr Cathy Foley AO PSM, Prof Peter Klinken, Dr Amanda Caples GAICD, Prof Caroline McMillen AO FAHMS, Hugh Durrant-Whyte, Bronwyn Harch.



NYSF ALUMNI STORIES



MAYA FARMER

Maya has a passion for STEM that knows no bounds. This passion began through reading copious amounts of science fiction, and was nurtured by her chemistry teacher Lucy Thomas. Although, growing up as student in regional New South Wales, Maya says opportunities in STEM were limited.

“Living in regional Australia, I have had few opportunities to engage in the future of science, with the few that I have been able to participate in and benefit from being online. For example, in Year 10, students get the opportunity to go on work placement with local businesses. However, I was unable to get work experience in the STEM field due to an absence of local science opportunities.”

The lack of STEM opportunities in her local community led her to seek out other learning and leadership experiences including participating in the United Nations Youth Negotiations competition, helping to organise the School Strike 4 Climate movement, and applying for the National Youth Science Forum.

Maya's story:



SAAD SABRI

Saad moved from Iraq to Australia midway through 2022, and despite nearly missing out on applying for the NYSF, he was successful and attended the Melbourne STEM Hub in January 2023.

Reflecting on his NYSF experience, Saad says the online program was a highlight and enjoyed the ease of access.

“It was literally the best time of my life and I'm not even trying to exaggerate! It was a wonderful experience starting from the online sessions. I really enjoyed the online sessions – they were easy to do because I was feeling comfortable sitting in my house in front of the computer and at the same time being able to have scientists talk from different places.”

He credits the in-person program at the Melbourne STEM Hub for helping him grow his confidence in meeting and talking to new people. In the past, Saad might have just stuck to himself and not tried to talk to anyone new, “I'll just be probably shy. Just don't want to bother them.” But because of the NYSF, he made an effort to talk to as many people as possible, “It gave me that drive to go and actually start a chat with every single person.” This has become a habit after the program, and Saad says he loves that he “got the chance to get a new skill of socialising with people.”

Saad's story:



NYSF ALUMNI STORIES



JOY FAN

Joy, an alum of the 2021 NYSF Year 12 Program, says her passion for STEM started as a child, "I was always the annoying child that repeatedly asked, "Why?" until adults (mostly my parents and teachers) would lose their patience. This unrelenting curiosity is what led me down the path of science, as I've always had a passion for learning about the mechanisms that underpin the functioning of our world."

When reflecting on her experience at the NYSF Year 12 Program, she found the most memorable moments to be "creating biodegradable plastic from potato starch in [her] own kitchen, the close-knit group of friends that [she] made," and the range of Zoom meetings and live crosses she participated in during the online sessions.

Joy is now studying a Bachelor of Science Advanced - Global Challenges at Monash University, and is looking forward to "jumping into the world of industry and research." She hopes that she "will be equipped with the skills and knowledge needed to address some of the world's most pressing problems."

Joy's story:



ZAHRAA AL MOSAWE

In a 2023 NYSF webinar, Associate Professor Rashina Hoda and NYSF alum and year 12 student Zahraa discussed their shared passion for STEM fields, reflecting on their personal journeys and the importance of diversity in STEM.

Zahraa shared that she felt uncertain about STEM during her upbringing, as her parents didn't have a background in these fields. However, a research project through CSIRO's CREST program on mycelium tiles in high school ignited her interest in STEM.

A/Professor Rashina Hoda recalled her own experience, highlighting her early fascination with physics. A chance encounter with a programming class in school opened up a new world for her. The logical and analytical nature of computer science captivated her, and she decided to pursue software engineering.

Both acknowledged the significance of representation, particularly for women, women of colour, and Muslim women in STEM. They also touched upon the challenges faced by those interested in STEM careers without adequate support.

Zahraa's story:



NYSF STUDENT STAFF LEADERSHIP PROGRAM (SSLP) 2022–2023

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

SSLP participants are required to apply for a position in the program. This application process includes a written application followed by interviews with shortlisted applicants. In 2022, there were over 120 applications across all three program levels. From this, 56 program positions were offered (3 Chiefs of Staff, 19 Admin Staff and 34 Group Staff). 52 participants completed the program forming the Staffie team.

Over the course of 2022, the Staffie team participated in a training program that focused on developing leadership, teamwork, facilitation skills and NYSF knowledge to prepare them for their role in January. The program was a mixture of digital and in-person experiences delivered by the NYSF, Staffie team and external providers, including;

- Monthly digital training sessions between May and December
- Two-day in-person training in hub locations in July
- Digital child protection training provided by Childwise
- Completion of first aid qualifications
- Digital pre-session training in January
- In-person pre-session training in hub locations in January

The team engaged enthusiastically with the training program, making the most of the opportunities for growth presented to them. The program's highlight for many was the opportunity to attend in-person SSLP training and build connections with fellow Staffies in person and digitally.

The 2024 Chiefs of Staff also engaged with NYSF Board members, Loren Atkins and Colonel Dr Renée Kidson CSM, to learn about leadership skills and receive advice about their own leadership journeys.

In January 2023, the Staffie team was able to put everything they had learned into practice as they facilitated the student experience of the NYSF 2023 Year 12 Program. They excelled in their role, bringing their own brand of energy and passion to all aspects of the program. They competently engaged with students by chairing and managing Q&A on digital sessions, facilitating hub experiences, and interacting with students on the Whova App and Discord server. They created a welcoming and safe environment for all participants and facilitated connections between students with some genuinely innovative social experiences both digitally and in hubs. Every one of them is to be commended on their professional approach, passion for the NYSF and how they fulfilled their role.

“

'Being a part of SSLP was absolutely incredible, and I'm so thankful for the opportunity to be a part of it in 2022/2023! I feel as though I have gained so many personal benefits from participating in SSLP, including my leadership capabilities growing so much.' – 2022/23 SSLP Participant

'SSLP training not only aided me on session but continues to benefit me in everyday within leadership teams and in everyday life.' - 2022/23 SSLP Participant

'It was one of the best experiences I've ever had, and I wouldn't trade it for the world. I'm so thankful for the people I met, and unlike as a student, I felt comfortable doing the role and confident, especially for the in-person events.' – 2022/23 SSLP Participant



NYSF CONNECT

WEBINAR SERIES

The NYSF Connect Webinar Series was launched in 2020 to provide continuing STEM career education, engagement, and networking opportunities to our NYSF Year 12 Program alumni, who in 2023 now numbered over 15,000.

In 2022, we presented eight educational webinars between April and November, as well as an online social trivia event for alumni. In total, the series featured 24 STEM professionals in a wide range of fields, from ecology conservation to engineering, neuroscience, and more.

Feedback from attendees on the sessions has been consistently high, with an average rating of 4.5 out of 5 stars across the series and 89.5% of respondents indicating they find the series "Extremely" or "Very" valuable. In 2022, there were a total of 272 live attendees, and thus far, over 800 online views across all sessions, which are made available indefinitely to alumni on our YouTube channel.

The NYSF Connect program continues to be relevant to alumni in today's ever-changing world, in which isolation and a lack of resources can affect emerging STEM professionals in their career journey, offering access to experts and leaders in STEM, information to further their career and study, and resources to connect with the broader community.

NYSF Connect

2022

April	Higher Education Hacks
May	Saving our ecosystems: how we make conservation decisions
June	What is engineering, anyway?
July	Unlocking the mysteries of the brain with neuroscience
August	STEM Through the looking glass
September	Shifting the dial on leadership culture in STEM
October	Volunteering: make it a part of your STEM journey
November	Tech innovation: life at the cutting edge of STEM

Thank you to all of our incredible webinar guests in 2022:

- Dr Cathy Foley AO PSM, Chief Scientist of Australia
- Stephanie C. Hill, Lockheed Martin
- Professor Russell Gruen, Australian National University
- Dr Sophie Calabretto, NYSF
- Dr Catherine Wheller, NYSF
- Georgia Hadlow, NYSF
- Dr Jarrod McKenna, NYSF
- Professor Eve McDonald-Madden, University of Queensland
- Professor Jason Sharples, UNSW
- Dr Sam Nicol, CSIRO
- Isabella Papadimitriou, NYSF alum
- Keren Reynolds, Lockheed Martin Australia
- Elanor Kloester, CSL
- Tayesha Papa, BAE Systems Australia (via Naval Shipbuilding College)
- Dr Dhanisha Jhaveri, University of Queensland
- Dr Gail Alvares, Telethon Kids Institute
- Hannah Vardy, NYSF alum
- Dr Brendan Holland, Deakin University
- Lucas Logan, Activate Health and Movement
- Lauren Hutchinson, Brien Holden Vision Institute
- Lorian Marshall, NYSF alum
- Ari Moloney, NYSF alum
- Anna-Maria Arabia, Australian Academy of Science
- Simon Palumbo, Silentium Defence
- Ruby Nicks, NYSF alum
- Dr Catriona Nguyen-Robertson, University of Melbourne
- Samantha Fewster, Australian Institute of Food Science and Technology
- Isaac Kozlovskis, NYSF alum
- Cpt Amy Powers, Australian Defence Force
- Matthew Yuen, ASC
- Lily Taylor, Defence Science Technology Group
- Prachi Dave, NYSF alum



I found it intriguing to have the ability to listen to such a large variety of different perspectives, due to the range of jobs presented.

- NYSF alum



I think the conversational style of presentation was super effective and the topics were pitch perfect.

- NYSF alum



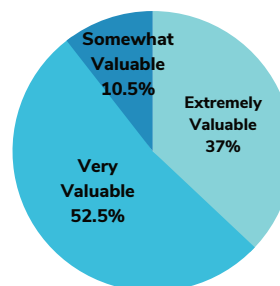
I really enjoyed the panellists' sharing their own unique experiences of how they got to where they are today.

- NYSF alum



4.5/5 STARS

- Respondents gave webinar sessions an average of 4.5 out of 5 stars across the series,



89.5% FIND VALUABLE

- Nearly 90% of respondents indicated they find the series "very" or "extremely" valuable.
- 0% responded they find the series "not very valuable" or "not at all valuable."

OVER 1,000 VIEWS

- 272 live attendees on the Zoom sessions, plus over 812 online views of webinar series videos on YouTube (as of February 2023).

NYSF IN THE COMMUNITY

STEM CHALLENGES

During the 2023 NYSF Year 12 Program, two STEM challenges were set: The first by Professor Veena Sahajwalla, and the second by Cosmos Magazine and the team at the Royal Institute of Australia (RiAus).

Professor Veena Sahajwalla challenged students to research their local area(s) and see what problems they have with waste and recycling. Then, using their knowledge of STEM, propose a solution! We received 12 innovative submissions ranging from reforming demolition waste to recycling solar panels.

Cosmos Magazine challenged NYSFers to develop a short script for a podcast on a STEM topic of their choice. They received 31 submissions and Jacinta Bowler, Science Journalist for The Royal Institution of Australia, and Gail MacCallum and Ian Connellan, Editors of Cosmos Magazine, commended the students for the quality of their ideas. They were so impressed, that they offered participants the opportunity to receive editorial feedback on their work and to record their podcast as part of a new series: Podcast Next Gen.



NATIONAL SCIENCE WEEK

National Science Week is an Australia-wide annual celebration of STEM. It encourages STEM professionals from around the country to connect with each other, and with people of all ages, by hosting events, answering hard-hitting questions, and running inspiring and interactive workshops.

In celebration of National Science Week 2022, the NYSF hosted a webinar titled, 'STEM Through the Looking Glass'. The webinar explored what makes up the workday of a diverse range of STEM professionals.

We were joined by a spectacular collection of guest panellists including:

- Dr Cathy Foley AO PSM, Australia's Chief Scientist
- Dr Brendan Holland, 2007 NYSF Alumnus and Research Fellow at Deakin University
- Lucas Logan, 2015 NYSF Alumnus and Exercise Physiologist at Activate Health and Movement
- Lauren Hutchinson, 2011 NYSF Alumna and Project Officer at the Fred Hollows Foundation

The webinar was co-hosted by NYSF alumni Ari Moloney and Lorian Marshall, and was made available to the general public as well as NYSF alumni.



NYSF AT THE AIRSHOW WITH LOCKHEED MARTIN

In February 2023, Lockheed Martin kindly sponsored 14 NYSF alumni to attend the Lockheed Martin Airshow in Avalon, Victoria. Participants expressed their appreciation for being invited to the event and noted that the speakers were exceptional and gave them fantastic insights into careers in the aerospace industry.

2023 NYSF alum, Melanie, found the experience to be particularly impactful, "I loved hearing from people with a wide variety of backgrounds and current careers. It gave me the opportunity to learn about career pathways that I hadn't considered before."

Melanie also found discussions with the Australian Defence Force inspiring, "Hearing from members of the Air Force, especially the technicians, made me more interested in the ADF as a possible career option. I loved hearing about all the aircraft they get to work on and the places they can travel."

She thanked Lockheed Martin for the opportunity to attend the airshow, a sentiment echoed by other NYSF participants who attended the event, "Thank you so much for the opportunity to learn more about the Australian Airforce and the work of Lockheed Martin. The presenters were all incredible, and I am so grateful for the opportunity to speak to people in the field I want to work in."



FINANCIALS

For the 2022–2023 financial year (1 April 2022 to 31 March 2023), the NYSF closed with a deficit of -\$132,609.

The NYSF's gradual reintegration of in-person and, looking ahead to 2024, residential programs introduces a level of financial uncertainty. However, the NYSF is pleased to report a deficit that is smaller than originally projected, despite a lower-than-anticipated number of NYSF Year 12 Program attendees this year.

The NYSF eagerly anticipates a return to residential programming in 2023–2024, alongside the launch of the National Youth STEM Summit and the commencement of NYSF's 40th birthday celebrations. The surplus operating results in recent years provide the financial security to fund this transition back to in-person and residential programming, ensuring our continued commitment to fostering youth engagement in STEM fields.

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

