STA NSW

YOUNG SCIENTIST

Young Scientist Awards 2025

Awards Presentation Ceremony

Friday 28 November

Hosted by:

University of Technology Sydney

UTS

Acknowledgement of Country

We at the Young Scientist Awards would like to pay our respects to the Traditional Custodians of this land on which we meet - the Gadigal of the Eora Nation. We recognise Country includes but transcends land and borders, being both belongingness and a way of being.

Recognising this, we pay our respects to Aboriginal peoples past, present and to those of the future who are our knowledge holders and teachers. As we share information, teaching, and learning, we remember to appreciate and value the knowledge embedded forever within the Aboriginal custodianship of Country.

Program

Master of Ceremonies

Philippa Miller, STANSW Young Scientist Awards Committee

Welcome Address

Prof. James Wallman, Dean, Faculty of Science, UTS

Presentation of Scientific Investigations Awards

Keynote Address

Dr Harley Scammell, UTS

Presentation of Technological Innovations Awards

Presentation of Encouragement Awards

Presentation of Sponsored Awards Part I

Message from Sponsor

Peter Bowditch, Australian Skeptics

Presentation of Sponsored Awards Part II

Announcement of Grand Awards

Lisa Cabral, Grand Awards Judging Panel

Closing Address

Lauren McKnight, Vice-President, Science Teachers Association of NSW

Generated from the titles of the 504 projects submitted to STANSW Young Scientist Awards in 2025.

Message from the STANSW President

Scientific inquiry fosters incredible skills, including curiosity, creativity, and critical thinking. In a time of rapid change, from advances in AI to the challenges of climate change, the importance of science education has never been clearer.

The Young Scientist Awards provide students across NSW with the opportunity to explore, question, and innovate. Each project presented tonight is a testament to the curiosity of our young people and the dedication of teachers who guide and inspire their students to think deeply about the world around them.

These awards not only recognise outstanding scientific achievement but also nurture the next generation of thinkers, researchers, and problem-solvers who will shape Australia's future.

On behalf of the Science Teachers Association NSW, I extend my sincere thanks to our sponsors and donors, whose support ensures that these opportunities remain open and equitable for students across the state. I also acknowledge the tireless work of our Young Scientist Committee, and thank UTS for their continued partnership in hosting this celebration of young talent.

Teachers, industry leaders, and institutions are together cultivating a vibrant and innovative future for science in NSW and Australia. To all the students recognised tonight, congratulations, and keep asking questions and exploring possibilities through science.

Amy Ayres
President, Science Teachers Association NSW

STANSW Young Scientist Committee

The STANSW Young Scientist Committee is a group of dedicated volunteers who work to develop innovative STEM strategies for supporting NSW teachers.

Philippa Miller (Coordinator)
Elizabeth O'Connor
Anjali Chandrasekar-Rao
Daisy Kong
Sian Ware
Matt McKenzie
Lisa Louie
Joanna Avraam
Sara Kyne
Lesley Gough
Lauren McKnight (STANSW Council sponsor)

Grand Awards Judging Panel

The Grand Awards Judging Panel reviews the top projects and selects the STANSW Young Scientist of the Year and the Rural Young Scientist of the Year.

James Cleaver (IBM) (Judging Chair)
Dr Lisa Cabral (UTS)
Dr Laura McKemmish (UNSW)
Dr Anne Forbes (Macquarie University)
Dr Kirsten Hogg (QASMT)
John Nicholls (AARNet)
Emma Serisier (Student UQ, Alumni)
Shirley Casper (Primary Judge)

Judges

Thank you to the 64 category judges, from schools and other institutions, who gave up their time to make this awards program possible.

Message from the Young Scientist Coordinator

Welcome to all students, families, and distinguished guests attending our Awards Presentation Ceremony in the Great Hall at UTS. We extend our gratitude to the Faculty of Science and Dean, Professor James Wallman, for generously providing this exceptional venue. We also extend our sincere thanks to our sponsors, whose support makes this award program possible.

It has been a productive and rewarding year for the Young Scientist program. In May, we hosted a highly successful webinar for teachers, outlining the process for entering Young Scientist, with over 90 participants. Later in the year, we held another well-received regional workshop at the Western Plains Zoo in Dubbo during the last term break, which generated very positive feedback from attendees. Throughout the year, we also continued to refine our feedback comment banks and update our rubrics.

At the 2024/25 ASTA iCubed Science Awards, NSW Young Scientists shone. Ellie Cole (PLC Sydney) and Tim Wilson (Barker College) were Grand prize winners for Innovation and Nevada Guiance (PLC Armidale) was a Grand prize winner for Inquiry.

There are some exciting new developments on the horizon for the Young Scientist program next year. Stay tuned for an announcement early in Term 1.

Finally, heartfelt thanks go to the dedicated committee members who generously volunteered countless hours to ensure the smooth and successful operation of the award program. I also extend my sincere gratitude to the STANSW Executive and office staff for their invaluable support and commitment.

Philippa Miller

Category Awards

Scientific Investigations K-2

Xena Bisits-Brack, PLC Sydney, *Which Colour Is Best For Peace Lilies?*

Xena aimed to find which artificial light colour was best for growing the indoor plant, Peace Lilies. The different light colours used in her testing were blue, red, white, green and yellow. Xena examined plant height, leaf condition and the number of flower buds. After 6 weeks, her results showed white light was the best for growing Peace Lilies.

Georgia Fitzpatrick, Holgate Public School, *Bubbly bubble trouble*

Georgia aimed to make the perfect bubble mixture from household ingredients. Her mixtures consisted of different combinations of water, dish soap, sugar and glycerine. Georgia measured the length of time bubbles lasted and the size of the bubbles. She concluded that a mixture of water, dish soap and glycerine held bubbles for the longest, but adding sugar to this mixture increased the bubble size.

Joseph Hoang, Jonathan Lin & Joanna Wong, Santa Sabina College, *Melted Chocolate in your pocket: A Comparative Study of Popular Chocolate Brands*

Joseph, Jonathan and Joanna investigated which type of chocolate was the most resistant to melting in one's pocket whilst exercising. They tested the chocolates in two conditions: with or without their original wrapping. From their findings, a Kit Kat chocolate performed best with its wrapper on and was the most suitable chocolate to keep in your pocket while exercising.

Darius Nourbehesht, Loftus Public School, *Does the temperature of a ball affect its bounce?*

Darius loves playing handball and investigated whether the temperature of a ball affects its bounce height. To keep his testing consistent, he made a ball drop from a piece of pipe and tested three balls five times each at three different temperatures. Darius concluded that the warm ball bounced the highest and therefore, when playing handball in winter, he would need to hit the ball harder to make it bounce.

Blake Rhim, Arden Anglican School, *Can I make a coin float on water?*

Blake investigated if a coin could float on liquid. He tested the density of a variety of liquids, the composition of different coins and the method of lowering the coin onto the liquid. Blake concluded that the Japanese Yen coin, as it is made from aluminium, can float since it is less dense than some of the liquids. By examining surface tension, Blake determined that one needs to gently lay the coin on the liquid with the aid of a paper clip to ensure the tension is not broken.

Elysia Roselle Woo, St Joseph's Catholic Primary School, *My Marvellous Medicine: A 7 year old's investigation into making medicines and class knowledge about medicines*

Elysia aimed to make medicines from household ingredients, one that could reduce acid levels in the stomach and one that would kill microbes. She examined many ingredients and trialled different binding agents. Elysia made a tablet from sodium bicarbonate to reduce stomach acid and found that cornflour was the best binding agent. She found that a combination of ginger and garlic was best to kill microbes.

Scientific Investigations 3-4

Charlotte Cheema, St Patrick's Catholic Primary School, ***How do different factors affect the amount of mould on bread?***

Mouldy bread is a very popular topic for investigation. Charlotte improved on it by independently investigating the effect of levels of light, amount of moisture and type of bread on how quickly bread moulds. She found that wholemeal bread stored in the dark with higher levels of moisture grew mould the fastest.

Sophie Cheung, Lucinda Jin & Alicia Kim, Arden Anglican School, ***Mealworms - conditions for completing life cycles***

Sophie, Lucinda and Alicia set up carefully controlled investigations into the effect of temperature and light on the rate at which mealworms progressed through the phases of their life cycle from larvae to pupae and finally adult darkling beetles.

Elanor Civardi, PLC Sydney, ***Can You Get Sunburnt Underwater and Does The Type of Water make a Difference?***

Elanor's project examined whether you can get sunburnt under water and if the type of water (fresh, pool or sea water) makes a difference. To test this, cyanotype paper was used with a UV light to test different depths of the 3 different types of water. With help from a robotic colour sensor, the results showed that the deeper the water the more UV light blocked with salt water blocking all UV light, even in shallow water.

Cyrus Nourbehesht, Loftus Public School, ***The hat and the cap, a comparison of a bucket hat and cap on UV exposure to the ear, nose and neck***

Many schools have a no hat, no play rule. Cyrus noticed that, if given a choice, most students choose to wear a cap because it is more comfortable and looks better. However, teachers and parents often recommend bucket hats because they provide more coverage. Cyrus wanted to find out which type of hat gives better protection. He designed an experiment using UV beads to test how much protection each hat provides. He found that no single hat provides complete sun safety, and extra measures like sunscreen may still be needed.

Elizabeth Ong-Ly, PLC Sydney, ***Rubb-Errrr: Should Tyres be Recycled into Rubber Crumb?***

Elizabeth was concerned about the environmental impact of small pieces of recycled rubber commonly used in playgrounds. To investigate if escaping rubber crumb is an issue, Elizabeth looked at how much rubber crumb could be found outside of the area it was originally installed. Unfortunately, through her multiple testing, it was discovered that a considerable amount of rubber crumb could be found up to 10metres away from the field where it was installed.

Penelope Prangell, PLC Sydney, ***Colour Me Distracted***

Penelope wanted to find out whether background noise affects how well students pay attention. To test this, she created a 'Stroop' test using Scratch - a test where you say the colour of words instead of reading the words themselves. She tested a large group of students over three days - with no background noise, with classical music, and finally with a podcast. The students did best when the podcast was playing, worst with no background noise, and somewhere in the middle with classical music.

Scientific Investigations 5-6

Mia Bogovic, Santa Sabina College, ***Taking a Deeper Dive into the Five Second Rule: Fact or Fiction? Your Baby Needs to Know!***

Is it safe to eat if it has been on the floor for five seconds? Mia found that it is not the time that food is on the ground but rather how much surface area contact there is between the food or object and the floor that determines how much bacterial transfer there is.

Thaddeus Candra, Redeemer Baptist School, ***The Polygon Fly-athon***

Thaddeus wanted to determine what parachute shape was the best for slowing down a fall. After testing eight different shaped parachutes ranging from three sided to ten sided, Thaddeus found that once there were five or more vertices, tension in the strings was not uniform and the parachute would get tangled.

Kaelyn Chik, PLC Sydney, ***Ocean Acidification and Its Effect on Octopuses***

Kaelyn investigated the effects of acidification on shellfish in order to find out what would impact the shellfish the most. The results of Kaelyn's investigation concluded that a lower pH level will result in a thinner shell, compared to shells with a higher pH.

Lillyanne Dell & Xingyan Zhong, Armidale City Public School, ***Mandarin Magic***

What type of mandarin is the sweetest? Lillyanne and Xingyan wanted to find out. Using a brix meter they measured sweetness in a variety of mandarins. From all the data that they collected the Royal Honey mandarin proved to be the sweetest.

Kushmi Jayaratne & Lotem Rotman, Armidale City Public School, *Ready Set Ant*

Kushmi and Lotem noticed some ants carrying what looked to be some sort of meat. The aim of their investigation was to find out if ants preferred a sugar substance or meat. Kushmi and Lotem used Meat ants and Black House ants to investigate. The majority of ants preferred the sugar substance.

Natalie Kam, Castle Cove Public School, *Home Compostable Bioplastics - Fact or Fiction?*

Natalie wanted to find out if products with a label claiming they were home compostable degraded in a home compost and whether aeration, pH and temperature affected the speed of degradation. She found that raising the temperature of the compost sped up the process of degradation but only in plant-based polymer products.

Kaitlyn Liucao, PLC Sydney, *Slippery Secrets of Hennessy St*

Kaitlyn investigated if a tiled path close to her school was safe to walk on. It is a covered path but it gets wet in the rain. She measured the dynamic coefficient of friction between her school shoe and the tiles using a spring balance. Her experiment showed that the path is not safe when it is wet.

Romilly Merani, PLC Sydney, *Meeting Meat Microscopically*

Romilly used physical and chemical methods of tenderising meat and compared these to a control group that had no tenderising. Romilly came up with several conclusions including that the strong chemical tenderisers of acid and base (citric acid and bicarb of soda), damaged cell membranes and changed the chemical composition of the skeletal muscle.

Scientific Investigations Biology 7-8

Third: **Lara Pan, James Ruse Agricultural High School,** ***Investigating the Mechanism of Button Battery Burns***

Lara's project investigated how increasing voltage during electrolysis affects the mass loss of ham tissue as a model for button battery ingestion. The results showed that higher voltages generally caused greater tissue degradation, with 8V producing the most pronounced mass loss, supporting the hypothesis that electrical energy accelerates hydroxide-driven tissue corrosion.

Second: **Abhinav Gupta, Northholm Grammar School,** ***Salt concentrations on the size of potatoes***

Abhinav's project investigated how different salt concentrations in distilled water affect the volume of potato cylinders through osmosis. The results showed that potato cylinders gained water and increased in volume in low-salt solutions, but lost water and shrank as salt concentration increased, supporting the hypothesis.

First: **Alice Mi, Meriden School,** ***The Grape Problem - How Not to Waste Your Food***

Alice's science project investigated how temperature and moisture affect the firmness of store-bought grapes over seven days, aiming to reduce household food waste. The experiment found that grapes stay firmer in cooler, humid environments with proper airflow, while higher temperatures and inconsistent moisture levels accelerate softening and splitting.

Scientific Investigations Biology 9-10

Third: **Congjing Zhu, Kincoppal - Rose Bay School of the Sacred Heart,** ***The Effects of UV-B Stress on the UV Resistance of Plants***

Congjing's project investigated how plant compounds such as flavonoids and sinapate esters respond to high UV-B radiation by regulating and screening harmful rays. Her results showed that parsley plant extracts initially increased in UV-blocking effectiveness before declining due to cell damage, highlighting their potential as sustainable, plant-based ingredients for environmentally friendly sunscreens.

Second: **William Vavayis, Cranbrook School,** ***The Effect of Light Intensity on Positive Phototaxis Movement Within Crepuscular and Nocturnal Insects***

William's project investigated how light intensities influence insect phototactic behavior to understand the ecological impacts of light pollution. By constructing light traps and testing from 0 to 1000 lumens, a strong positive correlation between light intensity and insect attraction was seen- demonstrating that light intensity is the primary factor driving insect activity.

First: **Sahana Kumar, Dhirubhai Ambani International School,** ***Sequence to Signal: Applying Artificial Neural Networks to diagnose HSV-1 through correlative comparison of 2015 and 2020 amino acid sequences***

Sahana's project developed an artificial neural network (ANN) using Python to detect HSV-1 (Herpes Simplex Virus-1) from amino acid sequences, comparing data from 2015 and 2020 to evaluate predictive accuracy. The ANN achieved high accuracy when optimised for key hyperparameters (hidden neurons, learning rate, and training duration), showing it could serve as a reliable, efficient alternative or complement to PCR tests for rapid viral diagnosis.

Scientific Investigations Biology 11-12

Third: **Amelia Watson, PLC Sydney, *Growing on Garbage: Does a plastic diet alter the growth, development and survival of* Tenebrio molitor*?***

Amelia explored how different plastic-based diets affected *Tenebrio molitor* (mealworms). Her findings showed that although survival rates were low overall, mealworms grew similarly on plastic and natural diets, suggesting potential for their use in reducing plastic pollution.

Second: **Shuyan Lin, Lambton High School, *Exploring the life cycle of* Tenebrio molitor *on a polystyrene diet: The potential for mealworms to reduce the impact of plastics in the environment***

Shuyan's project investigated how well mealworms (*Tenebrio molitor*) could survive, reproduce, and complete their life cycle when fed a polystyrene-based diet compared to a traditional oat diet. The results showed that while mealworms could metabolise and survive on polystyrene, long-term reproductive success and colony viability were greater with the oat diet.

First: **Michaela Loukas, Marist Catholic College Penshurst, *Assessing the Accuracy and Interpretability of a Recurrent Neural Network for Breast Cancer Classification and Molecular Subtyping using Ribonucleic Acid Sequencing Data***

Michaela investigated how a recurrent neural network could analyse gene expression data to distinguish healthy from cancerous breast tissue and classify molecular subtypes of breast cancer. Her model achieved high diagnostic accuracy, demonstrating that interpretable AI can enhance molecular-level cancer diagnosis and support clinical adoption.

Scientific Investigations Chemistry 7-8

Third: **Karin Iwano, Kambala,** ***The Effect of the Mass of Vitamin C Powder on the Peak Wavelength Absorbance Value***

Karin revisited a classic chemistry experiment through a quantitative approach. Using red cabbage extract as a natural pH indicator and vitamin C to adjust acidity, she measured the colour shifts using a spectrophotometer. Karin documented the rate of colour change and related this to the underlying structural changes in the anthocyanin molecules.

Second: **Mai Bui, Meriden School,** ***Investigation into the efficacy of chemical sunscreen when stored in extreme temperatures in vehicles during summer in Australia***

Mai investigated what happens when sunscreen is left in a hot car by placing samples in a temperature-controlled oven. By varying both the temperature and how long each sample was heated, Mai tested 56 different sunscreen conditions using several analytical methods. The results showed that while all sunscreens still blocked UV light, heat exposure caused changes in texture and consistency that affected how the sunscreen was absorbed by the skin.

First: **Maya Vojvodic, Meriden School,** ***The UV Filtration Effectiveness of Native Australian Plant Species***

Maya tested essential oils from six Australian native plants to explore their ability to block UV light. Some, especially lemon myrtle, performed almost as well as commercial sunscreen. By comparing different concentrations, Maya discovered that UV protection depended not only on strength but also on each oil's unique chemical makeup, particularly compounds like flavonoids, polyphenols, and citral.

Scientific Investigations Chemistry 9-10

Third: **Nethuli Pathirana, Kinross Wolaroi School,** ***Effect Of Storage Temperature On Free Fatty Acid Levels And Rancidity In Canola Oil***

Nethuli explored how storage temperature affects canola oil rancidity by measuring changes in free fatty acid levels. Results showed that higher temperatures significantly increased free fatty acid levels and therefore oil degradation. The findings recommend that canola oil should be stored at cooler temperatures to preserve quality and reduce food waste.

Second: **Atrin Bagherian, Hornsby Girls High School,** ***How does the fermentation period of Milk Kefir affect its acidity (pH)?***

Atrin's project researched how the time of fermentation of Milk Kefir impacted its acidity, a key factor in its probiotic properties. The project was situated in real-world cultural and dietary practices, particularly from the Persian tradition. The project explored how longer fermentation times led to increased acidity, offering insights that are useful for brewing Kefir at home.

First: **Luna Duan & Vivian Liao, Meriden School,** ***Sticky Situation***

Luna and Vivian investigated the potential of reusing expanded polystyrene (a commonly non-recyclable plastic) by dissolving it in acetone to create a glue-like adhesive. By examining how varying the mass of the plastic affects the strength of the resulting glue, the project explored a practical way to reduce plastic waste that was more sustainable and had real-world applications.

Scientific Investigations Chemistry 11-12

Third: **Omar Redha, Al Noori Muslim School - Senior Campus,** ***A study on reaction mechanisms of 3-aminophthalhydrazide through synthesis: Investigating common toxin implication of blood on chemiluminescence and potential reversal modes***

Omar synthesised the chemical luminol from readily available starting materials. The chemical's luminescence behaviour was then observed when exposed to various toxins added to blood samples. A series of controlled reactions was carried out following a clear, detailed method, and light intensity measurements allowed red blood cell lysis to be quantified.

Second: **Isla Costin, MLC School,** ***Not All Water Is Equal - Hard Ions, Soft Suds, and the Science of Collapse: A Quantitative Investigation into the Effect of Calcium and Magnesium Ion Concentration on the Foam Stability of a 1% Synthetic Dettol Liquid Hand Wash Solution***

Isla investigated foam stability in hand wash solutions. This project investigated the impact of increasing concentrations of calcium and magnesium ions, which mimicked "hard water". Through replicated trials and kinetic analysis, higher concentrations of ions led to accelerated collapse of the foam bubbles of the hand wash solutions.

First: **Noah Riva, Barrenjoey High School,** ***Spatial Heterogeneity of Surface Water PFAS Levels along the Snowy River, from its Source to Lake Jindabyne***

Noah investigated an important environmental issue – that of PFAS (per- and polyfluoroalkyl substances) levels in the Snowy River. Water samples were analysed to determine PFAS concentration, and found variation in the concentration depending on location. The project highlights the need to monitor water-quality to understand PFAS contamination in the environment.

Scientific Investigations
Earth & Environmental Science 7-8

Second: **Gwen Surawski, Canterbury Girls High School,**
Turning Waste into Growth: A Comparative Study of Urine-Derived and Commercial Fertilisers for Sustainable Agriculture

Human waste-derived fertilisers have the potential to serve as sustainable and effective alternatives in agriculture. Using a urine-derived fertiliser sourced from a university-affiliated sustainability research project, Gwen demonstrated that plant growth was supported comparably, and in some cases better than with the commercial alternative.

First: **Amy Dou, PLC Sydney,** ***The Beetle's Back***

Inspired by the Nabib Desert beetle, Amy investigated how different surface textures affect the volume of water collected when simulating fog collection in arid environments. Her results showed that the bumpy surfaces, such as those on the beetle's back, combined with a hydrophobic coating, were the most effective.

Scientific Investigations

Earth & Environmental Science 9-10

Third: **Rebecca Li, PLC Sydney,** ***Sticky Solutions - Investigation into seed-based mucilage for entrapment of microplastics in water bodies***

Rebecca tested the effectiveness of mucilage extracted from the seeds of basil, flax, psyllium and salvia seeds for their ability to trap microplastic beads. Her investigation demonstrated that the flax and psyllium seed mucilages were the best at trapping the beads.

Second: **Catherine Weir, PLC Sydney,** ***The most effective washing method for pesticide removal***

Catherine investigated the effectiveness of three washing methods—plain water, a baking soda solution, and a commercial produce wash (Enviroclean)—in reducing carbaryl pesticide residues on strawberries and kale. The results showed that Enviroclean was the most effective and plain water the least effective.

First: **Xinyue (Kitty) Liu, PLC Sydney,** ***Mini UV Shields: Investigating the Potential of SiO_2-based Nanocoating for the Prevention of Microplastic Shedding from Popular Outdoor Surfacing Materials***

The degradation of synthetic turf surfaces is a major source of microplastic pollution in the environment. Kitty's investigation demonstrated that coating artificial grass and wet pour rubber with a SiO_2 nanocoating substantially reduced the release of microplastics from these surfaces.

Scientific Investigations
Earth and Environmental Science 11-12

Third: Fintan Macintyre, Killara High School, *Examining how temperature affects the rate of release of hydrogen sulfide gas during the decomposition of* Ulva lactuca

Coastal accumulations of decaying macroalgae such as *Ulva lactuca* (sea lettuce) can produce hydrogen sulfide (H_2S), a toxic gas with public-health implications. Fintan's investigation demonstrated that higher temperatures increased the production of H_2S suggesting that warmer conditions due to climate change may shorten the interval to hazardous gas accumulation following seaweed strandings.

Second: Thea Barron, Lambton High School, *Impact of our shorelines on the fragmentation of microplastics*

Thea used a rotating barrel tumbler to simulate how waves and suspended particulates like sand within the surf zone influence the fragmentation of microplastics. Her results showed that microplastic fragmentation in the surf zone was statistically higher than in the open ocean, suggesting that the removal of plastic debris from the shoreline could have an important role in reducing microplastics in the ocean.

First: Bonnie Andrews, Lambton High School, *Microplastics in Australian Personal Care Products: A Persistent Environmental Concern*

Bonnie's investigation uncovered concerningly high levels of microplastics in six personal care products common in the Australian market. This finding demonstrates that despite the 2016 government mandated voluntary phase-out of plastic microbeads in rinse-off products, there is a need for stronger overview and testing of cosmetic products being sold in Australia.

Scientific Investigations Physics 7-8

Third: **Mihika Garg, Meriden School,** ***Heat Insulation***

Mihika identified that insulation was critical in keeping buildings comfortable and reducing energy use and costs. She conducted an experiment to compare the insulating properties of several common materials using a hair dryer to provide heat. She found that bubble wrap trapped heat the best over ten minutes.

Second: **Ella Hou, Meriden School,** ***Star Visibility***

Ella was interested in the role of temperature on astronomical 'seeing'. She used a laser as a simulated star and a light sensor app to model the behaviour of a point of light in different temperatures of air. Her results showed that a higher temperature resulted in the light getting scattered across a larger area and hence appearing dimmer to the sensor.

First: **David Kingma, The Scots School Albury,** ***Investigating the effect of smoke and flame on the arc distance of high voltage transmission lines***

David was concerned about the safety implications to firefighters of flame and smoke allowing arcing at longer distances than usual. He set out to explore this through small scale modelling. His experiment showed that the arc distance increased by up to 19 times compared to the control, with flaming dry conifer leaves the worst.

Scientific Investigations Physics 9-10

Third: **Elisabeth Fuller, Loreto Kirribilli,** ***Investigating the effects of short-term hygrometric fluctuations on the pitch stability of stringed instruments***

The pitch of a note on a stringed instrument can be affected by environmental conditions, like temperature and humidity. Elisabeth focused on the effect of sudden changes in humidity on pitch for a cello, a ukulele and guitars. The data showed that the pitch changed significantly during sudden humidity changes, but was more consistent if the humidity was stable.

Second: **Neomi Verma, Abbotsleigh,** ***The Scattering Signature of Aerosols***

Rayleigh scattering occurs when light scatters from tiny particles - this process is why the sky is blue. Neomi used Rayleigh scattering to determine the relative particle size of different aerosol deodorants. She compared actual measurements of scattering to predictions using Rayleigh scattering. This showed that some of the deodorants fit the predictions, while others likely had larger particles where Rayleigh scattering doesn't apply.

First: **Jamie Yeung, Cranbrook School,** ***The Effect of Yaw Angle on the Power Output of Horizontal-axis Wind Turbines***

Wind turbines play an increasingly important role in electricity generation across Australia. Jamie modelled the effect of yaw - the angle between the wind direction and the rotational axis - on the amount of power generated. He found that the output varied with the cosine of the angle, consistent with the literature.

Scientific Investigations Physics 11-12

Third: **Cooper Lucas, Inaburra School,** ***The Quantum Revolution: A Comparison Of Superconducting And Spin Qubits In Implementing Grover's Algorithm***

Quantum computing has great potential, and maintaining the fidelity of the qubits will be critical. Cooper compared two types of implementations of quantum computing - spin qubits and superconducting qubits. His investigation showed that the spin qubits had an accuracy of 95%, while the superconducting qubits were significantly lower at 79%.

Second: **Max Morrow, SHORE - Sydney Church of England Grammar School,** ***Comparative analysis of the performance of airfoil parameterisation and optimisation methods***

Airfoils are mechanical elements that generate a lift force, as in an aircraft. Max set out to work out how to best optimise the characteristics of the airfoil to maximise the lift-to-drag ratio. He tested five different parameterisation methods and five optimisation algorithms and compared them using computer modelling. The most efficient combination NURBS parameterisation and GA optimisation.

First: **Matt Warnes, SHORE - Sydney Church of England Grammar School,** ***Material-Specific Effects of Electrode Surface Roughness on Electrical Efficiency and Flow Rate in MHD Propulsion***

Magnetohydrodynamic (MHD) propulsion systems use electric and magnetic fields to move conductive fluids without mechanical components. Matt investigated the effect of surface roughness and the choice of material. Optimal roughness varied by material, with aluminium of moderate roughness providing the greatest efficiency.

Keynote Speaker

Dr Harley Scammell

How big can a quantum object be? What would happen if you accidentally changed the number of space dimensions? Does any of this actually matter?

Harley is a theoretical quantum physicist and Senior Lecturer at the University of Technology Sydney. He completed his PhD in Theoretical Physics at UNSW in 2017, focusing on quantum phase transitions. From 2018 to 2020, he was a Fulbright Postdoctoral Fellow at Harvard University, researching quantum and topological phases of matter. He then joined the ARC Centre of Excellence in Future Low-Energy Electronic Technologies to investigate the theoretical foundations of next-generation quantum devices.

Harley's current research explores collective quantum behaviour—from unconventional superconductivity and topological order to quantum phase transitions—and how such phenomena can be harnessed for emerging technologies.

Technological Innovations K-2

Felix Hellmich, Knox Grammar Preparatory School, *Sunlight Pot Plant*

Felix set out to solve the problem of keeping indoor plants healthy. He created a plant pot using Tinkercad and an environmentally friendly plastic called PolyTerra PLA. He then programmed a BBC Micro:bit with a soil sensor to measure both the soil's moisture level and the room temperature. Felix tested the Sunlight Plant Pot using tomato plants.

Andreas Ishak, Trinity Grammar School Preparatory School, *How to Train Your AI Brain*

Andreas developed BWaiV, a proof-of-concept AI-powered maths app for students in K-2. The app uses artificial intelligence and machine learning to help children solve maths problems independently, reducing their need to ask the teacher for help. It provides scaffolding to break down learning into small, manageable steps. After several trials, Andreas successfully trained the AI brain to recognise addition and subtraction problems.

Technological Innovations 3-4

Boya Li & Aaron Tung, Arden Anglican School, *Badminton Shuttle Collector*

At a badminton game, Boya and Aaron saw a girl practising with a machine that served shuttles for her to hit. After she finished hitting all the shuttles, she used a broom to gather them into a pile, picked them up, and put them back into a basket. Boya and Aaron wondered why there wasn't a machine to do this job, so they created the Auto Badminton Shuttle Collector (ABSC), using a Lego EV3 robot. The robot follows marking tape on the floor, picks up shuttles with its grabbing arms, and pushes the shuttles into a net above the ground. This way, players don't have to bend down to pick them up.

Madoc Taylor, Knox Grammar Preparatory School, *Focus Buddy*

Madoc created Focus Buddy to help people manage their time better and in particular support users with ADHD concentrate on one task at a time. His invention is a small, wearable timer and metronome device that uses gentle vibration alerts, a bright OLED screen, and clear countdown timers to support better focus without distractions. Madoc used Arduino technology and a 3D printed case to create Focus Buddy.

Technological Innovations 5-6

Isaiah Ghaly & Tony Tartak, Trinity Grammar School Preparatory School, *See and Say*

Isaiah and Tony wanted to bridge the communication gap between hearing and deaf or hard-of-hearing people. They worked on developing their own AI machine to translate sign language hand movements into speech or spoken language. Isaiah and Tony used the website called Teachable Machines Version 1 to create their model. When collecting data they used both male and female hands with varying skin tones. To create the initial model Isaiah and Tony used the signs for 'thank you', 'help' and 'sorry'.

Ciana Van De Linde, PLC Sydney, *Stick to the Pointe with the Stick-or-Slip Invention*

Ciana is a ballet dancer and to avoid slipping when she is going on pointe, she can use either dry rock rosin or aerosol rosin on the soles of her footwear. Both rosins create problems as they are messy and can cause damage to dance floors. Ciana's invention, to help solve these problems, is a small portable device that can easily fit into any dancer's bag or pocket and has an exchangeable top so it suits both dry and liquid rosin. This allows the dancer to not only apply rosin with minimal mess but also enable them to have more choice between dry and liquid rosin.

Technological Innovations 9-10

Second: **Lilian Preston, PLC Sydney, *Out Of The Frypan, (Not) Into The Fire: Making Cooking Wheely Safe***

Cooking with a frypan can be quite a haphazard process, especially when you are facing spitting hot oil and flying fried foods. Lilian tested thermoplastic polyester and polycarbonate materials to develop an eye and face protection barrier. Tests showed that thermoplastic polyester was more suitable. Lilian's barrier design will provide protection to people in wheelchairs when cooking on stovetops.

First: **Jack Healy, Flynn Nolan & Ryley Nolan, Saint Ignatius' College, *"Water Stairs" - Extending the water lifting capacity of Air-Lift pumps***

Jack, Flynn and Ryley got water moving without the use of mechanical components, reinventing traditional air-lift systems. Their design has air bubbles injected once at the bottom and carried through a continuous air bypass spine. At each stage, oval reservoir tanks collect water and pass it upward in small steps, while bubbles bypass pressure locks and continue to the next stage. With an in-built solar air pump, this invention can be used without an electrical power supply.

Technological Innovations 11-12

Kai Vissers, St Luke's Grammar School, Bye Bye Birdy, *All-in-One AI Bird Scarer System*

Birds can be quite disruptive - too often they poo where we sit! Kai developed a system to shoo this problem away. He was able to construct a device which reliably deters bird pests without causing harm to them. Kai's device stands out from other bird-deterring systems on the market by being able to detect birds which triggers coordinated movement/light/sound, whilst also showing live footage and log events.

Luka Raspudic, St Patrick's College, Strathfield, *Injury prevention ski binding*

Ski injuries often occur when the upper body twists with the ski boots bound to the ski binding resulting in huge stress to the knee joint hence causing injuries. L R reinvented ski binding to reduce knee injuries by redesigning the heel and toe components of the ski binding. His design allows for pivoting, preventing lateral movements from being forced into the knee, and releasing the ski boot at multitude of angles which is crucial in situations such as a backwards-turning falls.

Encouragement Awards

Primary

Awarded to highly commended students who show particular promise and are encouraged to pursue further development

Antonio Daher, Ryan McGinty & Paxton Taylor, St Patrick's Catholic Primary School, *Bohemian Splashody*

Antonio, Ryan and Paxton investigated which soap helped give the fastest ride on a slip n' slide. They found shampoo gave them the fastest ride and dish washing soap gave them the slowest. They also discovered that having the slip n' slide at an angle of 40° maximised their speed.

Noel Justin & Thoman Mann, St Michael's Catholic Primary School, *3, 2, 1, LAUNCH!*

Noel and Thomas investigated how changing the weight and shape of an air rocket affects the distance it travels, as well as the angle of a rocket launcher. They created their own rocket launcher and base to complete their investigations.

Alfred Lee & Nicholas Nahlous, St Raphael's Catholic Primary School, *Mould Growth on Bread*

Alfred and Nicholas investigated the conditions mould would grow the most on bread. Their key finding was that mould grew the most in warmer temperatures. Alfred and Nicholoas concluded that "store shelf" bread included the extra ingredients of vinegar and emulsifiers which may have reduced mould growth.

Lester Liu, Redeemer Baptist School, *Dice Dilemma*

What makes a dice 'fair' and if the faces aren't even, how would that change the results of repeated throws? Lester conducted a scientific investigation where he tested what would happen if one face on a dice was not equivalent and what happened if that one face got slightly bigger. He made 3D printed dice for his investigation. Lester found that a fair dice must have symmetry and the faces must be congruent.

Jimmy Neill, Armidale City Public School, *Steers*

Jimmy's experiment investigated whether steers treated with Hormonal Growth Promotants (HGPs) gained more weight over a 75-day period compared to untreated steers. Fourteen steers were divided into two equal groups. All steers were kept under identical conditions and fed the same diet. Weight measurements were taken at the start and end of the trial. Results showed that HGP-treated steers had a more consistent and higher average daily weight gain than untreated steers.

Bowie Staley-Lobo, The Scots College Preparatory School, *How Magnets Can Protect Mars: A Cathode Ray Experiment*

The aim of Bowie's investigation was to see if a magnet can make the beam in a cathode ray tube bend. He found that a magnet can bend a cathode ray and the stronger the effect of the magnet, the more the beam would bend.

Duncan Stewart, Sapphire Coast Anglican College, *Under Pressure*

For many years Duncan has participated in tumbling. It is a sport where you run down carpeted ground towards an air-track and do a series of flips and twists on the air-track before landing on a soft crash mat. The aim of his investigation was to determine the optimal pressure in an air-track to get the highest bounce. Duncan concluded that for a 10 metre by 2 metre air track the optimal pumping time was five minutes.

Oliver Thorne-Kim, St John Bosco Catholic Primary School, *The Effect of Weight on Balloon Lift-Off: From Lego to Up, Up and Away*

Oliver wanted to investigate if balloons could lift objects into the air. He used a Lego man and tested both air-filled and helium-filled balloons to see which ones could float and carry weight. Oliver discovered that helium balloons can lift small objects like Lego men, but breath-filled balloons cannot. He also learned that the heavier the object, the more helium balloons are needed to lift it. From his results Oliver calculated that it would take over 5,000 helium balloons to lift his body weight!

Annabelle Gervaise Woo, St Joseph's Catholic Primary School, *Hot Stuff: A 9 year old's investigation into climate change*

Annabelle loves the environment and tries to take care of nature. In her project she completed several investigations exploring climate change and she also investigated how much her classmates know about climate change and global warming. One of her investigations involved using Bureau of Meteorology data for temperatures in her local area. Annabelle discovered that temperatures increased over time, for both January and annual readings, from 1939 to 2025.

Secondary

Charlotte Ballantyne, Parkes Christian School, ***How do different surfaces and environments affect fingerprint durability?***

By studying how fingerprints change over time, Charlotte investigated the effects of surface type and environment on print degradation. The project found that prints on metal changed the least, while those on paper, and those exposed to more light and warmth, degraded the most. These findings support forensic practices that prioritise collecting prints from bright or porous surfaces first, while prints on metal may remain intact for much longer.

Holly Bennett, Kinross Wolaroi School, ***Reproductive Rate of Maiden Ewes and the Relationship with Liveweight at Mating and Birth Type***

Holly's project explored how birth type and mating weight affect fertility and reproductive success in maiden Merino ewes. The study found that ewes born as multiples and those with higher liveweight at mating had higher fertility and twinning rates, suggesting that both factors play key roles in improving reproductive efficiency in young ewes.

Dion Bonetti, The Riverina Anglican College, ***The Rate of Electrolysis and its Influence on the Production of Hydrogen Gas***

Dion's experiment demonstrated the production of hydrogen gas from one of Earth's most abundant resources—water. By varying salt concentrations, he showed that higher levels increased conductivity and reaction rate, making hydrogen generation more efficient. He also identified safety limits, noting that excessive salt can lead to chlorine gas formation.

Isla Bromley, The Riverina Anglican College, *Conniwink (*Bembicium nanum*) Abundance and Distribution*

Isla used quadrat counts along transects at Plantation Point, Vincentia to determine the abundance and distribution of the common mollusc, conniwinks. She found that the maximum abundance of conniwinks was in the intertidal zone at 20 m from the tide line, making them potentially vulnerable to changes in sea level due to climate change.

Samantha Burrell, Nowra High School, *Chicken Plumage Genetics*

Samantha's project tested whether chicken feathers could provide viable DNA for future studies on plumage pigmentation genes. The investigation confirmed that DNA can be extracted from feathers, but environmental contamination and gene expression specificity can affect PCR reliability, highlighting the need for careful gene targeting in future research.

Sophie Eastburn, Leanne Rose Galang & Saraya Prakashbabu, St Johns College, *Decoding Identity: Are Fingerprints the Window to Our Biology?*

Sophie, Leanne and Saraya's investigation examined whether fingerprint patterns—arches, loops, and whorls—correlate with physical traits, health conditions, and taste preferences in adolescents. The study found preliminary evidence supporting links between fingerprint types and certain biological characteristics, suggesting fingerprints could serve as non-invasive indicators of genetic and health predispositions.

Tasmiah Eidnath, Moorebank High School, *Quantitative Assessment of the Antibacterial Efficacy of Limonene Functionalised Gold Nanoparticles Against* Escherichia Coli

Tasmiah's project tested the antimicrobial effects of gold nanoparticles (AuNPs), limonene, and their combination against *E. coli*. The results showed that AuNPs alone had the strongest antibacterial activity, outperforming both the combination treatment and standard antibiotics, suggesting their potential as effective non-antibiotic antimicrobial agents.

Natalie Gilmore, Gosford High School, *The Prevention of Zinc Dendrite Formation and Hydrogen Evolution in Zinc Batteries*

Natalie investigated how modifying electrolyte composition in zinc batteries can stop zinc dendrite formation and reduce hydrogen evolution, which are major issues that decrease battery safety and performance. The project tested additives and identified that some could significantly improve battery stability. This could potentially have promising real-world applications for producing safer batteries.

Wesley Mitchell, Ashfield Boys High School, *How long should I run a bubbler before I drink from it?*

Wesley investigated heavy metal contamination in public drinking water fountains across Sydney and assessed whether flushing reduces concentration to safer levels. While results varied between sites and heavy metal element, his results indicate that flushing could be a simple yet effective practice to limit exposure to heavy metals from aging public drinking water facilities.

Lahna Skillings, Nowra High School, ***The feasibility of closed ecosystems for Mars***

Long duration space exploration missions to Mars will require the creation controlled, closed-loop ecosystems to create habitable spaces for humans. Lahna's investigation examined the effect of varying leaf surface areas on the survival duration of plants in a sealed terrarium. She found that larger leaved species such as cabbage maintained the most stable O_2 levels.

Jasmine Smyth, Sapphire Coast Anglican College, ***Twin Telepathy***

Jasmine's experiment was designed to see if twins had a closer psychological connection than compared to other demographics. She determined that identical twins had the highest percentage of the same/associated responses. Interestingly close friends came second in front of fraternal twins/siblings.

Cooper Tamayo, Elizabeth Macarthur High School, ***Tree-mendous preferences: The housing market according to little forest bats***

Cooper analysed radiotelemetry data to determine the roost preferences of the Little Forest Bat, *Vespadelus vulturnus*. His data showed that live mature trees with hollows are essential in providing suitable habitat for these tiny but important microbats to flourish.

Luisa Valenzuela, Thomas Reddall High School, ***Utilising Machine Learning for Predicting Thyroid Cancer Recurrence***

Luisa's project used machine learning to predict thyroid cancer recurrence from patient data. The Random Forest model achieved near-perfect accuracy, identifying treatment response and lymph node factors as key predictors, showing the potential of AI to improve early detection and personalized care.

Sponsored Awards

Primary Environment Award

Awarded to the primary school project that best addresses a significant environmental issue or adds to our understanding of the natural environment

Natalie Kam, Castle Cove Public School, *Home Compostable Bioplastics - Fact or Fiction?*

400 million tonnes of plastic is produced each year, almost all sent to landfill! Will home compostable products help solve this problem? Natalie composted eight products that claimed to be home compostable. After 60 days of composting only three of the products showed signs they were breaking down.

STEP Environmental Award

Awarded for the best project relating to environmental protection and conservation

Cooper Tamayo, Elizabeth Macarthur High School, *Tree-mendous preferences: The housing market according to little forest bats*

Cooper used radio telemetry data to investigate roost preference of the Little Forest Bat in coastal sclerophyll forests. He found that roost trees were larger and taller with more hollows than non-roost trees in the same habitat. His results demonstrate the need to consider both local and landscape features when considering conservation measures for microbat species.

RACI Chemistry Encouragement Award

For primary and secondary students demonstrating ability, skill and promise for Chemistry

Primary

Highly Commended: **Romilly Merani, PLC Sydney, *Meeting Meat Microscopically***

Romilly investigated chemical and physical meat tenderising methods, including fruit enzymes, citric acid, bicarbonate of soda, salt and a commercial tenderiser. She found the strong chemical tenderisers of citric acid and bicarb of soda damaged cell membranes and changed the composition of skeletal muscle.

First: **Amara Jeyaganesh, Santa Sabina College, *Which method of coating of metal will protect it from oxidation and corrosion the most effectively?***

Amara investigated which method of coating metal protected it from oxidation and corrosion the most effectively. She coated metal in oil-based paint, oil, salt water, water-based paint, plain water and had a control metal plate. She found oil-based paint protected the metal the best.

Secondary

Highly Commended: **Smiti Noor, Elizabeth Macarthur High School,** ***The Effect of Electron Configurations of Hydrogen, Helium and Sodium Atomic Emission Lines on Experimental Calculations of Rydberg's Constant***

Smiti compared emission spectra to study how electron configuration affects calculations of Rydberg's constant, which predicts the light wavelengths emitted by atoms. She found that values increased with atomic number, with hydrogen most accurate and sodium less so due to multi-electron effects.

Equal First: **Omar Redha, Al Noori Muslim School - Senior Campus,** ***A study on reaction mechanisms of 3aminophthalhydrazide through synthesis: Investigating common toxin implication of blood on chemiluminescence and potential reversal modes***

Omar investigated how toxins impact red blood cells. By synthesising haemolytic compounds, he observed that toxins reduced the luminol reaction, suggesting a link between chemical damage and catalytic loss. The study also explored how restoring luminescence could indicate detoxification, demonstrating the potential for studying toxin–antidote interactions.

Equal First: **Omar Redha, Al Noori Muslim School - Senior Campus,** ***Influence of Polycyclic Aromatic Hydrocarbon Accumulation on Carbon Sequestration Potential and Chlorophyll Capacity of Melaleuca species***

Omar compared samples of *Melaleuca* plants from areas with different pollution levels. Higher air pollution correlated with greater accumulation of polycyclic aromatic hydrocarbons (PAHs) and reduced chlorophyll content, indicating lower photosynthetic efficiency and carbon storage capacity.

ASBMB Award

Awarded for a project that displays good understanding of processes in molecular biology

Claudia Bell, Kincoppal-Rose Bay School of the Sacred Heart, *Comparative Proteomic Analysis of Ampicillin Treated and Untreated* E.coli *Bacteria*

Claudia's project examined how *E. coli* changes its protein expression when exposed to the antibiotic ampicillin, revealing 20 significantly altered proteins linked to cell envelope structure and metabolic adaptation. The results suggest that *E. coli* activates nutrient stress pathways and modifies metabolism to survive antibiotic stress, highlighting potential targets for future studies on bacterial resistance.

AARNet Mathematics Award

Awarded to projects that stand out for exemplary understanding and application of mathematical concepts

Liam Kelly, Castle Cove Public School, *Picking A Winner - Analysing Junior Baseball statistics*

The aim of Liam's investigation was to find out which statistics were the best predictor for wins in junior baseball. He wanted to find out if he could predict the winner of the 2025 Little League Australian National Baseball Championships using statistics from all the State Championships. Liam's analysis suggested that when selecting teams, coaches should look to players who are able to get on base by selecting the right pitches to swing at or leave, pitchers who throw more strikes than balls and fielders who can safely field the ball without fumbling.

Neomi Verma, Abbotsleigh, *The Scattering Signature of Aerosols*

Neomi's project investigated the particle size of aerosols from common spray deodorants by analysing how laser light of different wavelengths scattered through each sample. Using detailed physics equations and mathematical modelling based on the Rayleigh scattering principle, she estimated particle sizes and identified ingredients—isohexadecane, zinc neodecanoate, and isopropyl myristate—associated with the smallest, potentially higher-risk particles.

AARNet Use of Technology Award - Primary

Awarded to projects that stand out for their exemplary or innovative use of technology – digital, electronic or analogue.

Third: Tony Tartak and Isaiah Ghaly, Trinity Grammar School Preparatory School, *See and Say*

Tony and Isaiah were learning how to use AI to help develop a solution to a problem. They chose to create AI software that could bridge the communication gap between hearing and hard of hearing people. Tony and Isaih used a website called Teachable machines to train the machine to interpret sign language.

Second: Noel Justin and Thomas Mann, St Michael's Catholic Primary School, *3, 2, 1, LAUNCH!*

Noel and Thomas designed and built a rocket launcher, so they could launch paper planes with varying air pressure. They built the paper plan rocket launcher with plastic tubing and an air pressure pump. Noel and Thomas also investigated how the weight of a rocket, rocket shape and launch angle affected the distance the rocket travelled

First: Isabel Zarimis, PLC Sydney, *Sightseek*

Isabel wanted to help people who are blind or have trouble seeing by designing a wearable device that made it easier for them to move around safely. Her project used micro: bit sensors attached to a hat to find out where obstacles were and how far away they were. The sensors sent vibrations to a watch on the wearer to let them know which direction the objects were in.

AARNet Use of Technology Award - Secondary

Third: **Aarav Bhatt, James Ruse Agricultural High School,** ***Synthetic Data Driven Random Forest Modelling Approach for Predicting Front-End-of-the-Line Silicon Wafer Cleaning Damage***

With the boom of semiconductor use in major industries such as medicine, finance and engineering, cleaning of the silicon wafer surface is critical to maintain its functionality. Front-end-of-the-line (FEOL) cleaning processes are essential for removing contaminant build up. Aarav found using a random forest regression machine learning model enabled him to reliably predict the damage probability for different FEOL cleaning processes.

Second: **Chloe Zhou and Cindy Shen, Meriden School,** ***Windwatch***

Chloe and Cindy designed a bladeless wind turbine which will reduce space and be safe for birds. The turbine will also function as a flag on beaches. They were able to construct a small-scale prototype after many modifications and testing.

First: **Jack Healy, Flynn Nolan & Ryley Nolan, St Ignatius College,** ***"Water Stairs" - Extending the water lifting capacity of Air-Lift pumps"***

Jack, Flynn and Ryley's air-lift reinvention had injected air bubbles carried through multiple stages of reservoir tanks. As bubbles bypass pressure locks, water moves upward step by step in one continuous air bypass spine. The integration of an in-built solar air pump adds to the versatility of the product.

AIP Best Physics Investigation Award

Awarded to K-6 projects that stand out for their use of physics

Third: Paxton Taylor, Antonio Daher & Ryan McGinty, St Patrick's Catholic Primary School, *Bohemian Splashody*

Paxton, Antonio, and Ryan studied the laws of motion and applied them to investigate how the type of soap and the angle of a slip 'n' slide affect speed. Needless to say they had lots of fun testing their hypotheses. If you want to go fast they recommend the use of shampoo and have your slip n' slide at a 40°.

Second: James Shaddock and Davis Vassallo, St Patrick's Catholic Primary School, *Wind Turbines of Power*

James and Davis investigated wind turbine design. Their project aimed to explore how turbine blade shape, number, and speed affect voltage output. James and Davis learned about the conversion of kinetic energy to electrical energy

First: Patrick Taylor and Ashley Pandaeng, St Paul of the Cross Catholic Primary School, Dulwich Hill, *Parachutin' with Newton*

Patrick and Ashley investigated the forces of gravity and air resistance. They explored how parachute diameter and weight affect airtime. Patrick and Ashley found that a parachute will fall more slowly if it is larger.

AIP Best Application of Physics Award

Awarded to 7-12 projects that stand out for their real or potential application of physics to address real-world problems

Third: **Luke Stewart, Inaburra School,** ***A Mock Test of Post-Einstein Gravity: The Brans-Dicke Theory***

The Brans-Dicke theory is an extension of General Relativity. Using mock data related to a particular gravity wave event, Luke compared parameters calculated using the two theories and found that the Brans-Dicke theory was more successful, suggesting that this method of analysis was a feasible test.

Second: **Samantha He, PLC Sydney,** ***Experimental Analysis of Gadolinium's Magnetocaloric Effect***

The use of gadolinium for cooling has potential as sustainable refrigeration option. Samantha explored the effect changing the magnet separation on the change in temperature, showing that with weak fields, environmental noise can obscure the result. This emphasises a key challenge for this technology.

First: **Jamie Yeung, Cranbrook School,** ***The Effect of Yaw Angle on the Power Output of Horizontal-axis Wind Turbines***

Jamie's investigation looked at the relationship between yaw angle and power, with the aim of ensuring optimal efficiency of the turbine. The results matched the hypothesis, with angles on or near 0° showing a greater power output.

Grand Awards - Primary

Budding Young Scientist

The Budding Young Scientist award is presented to the student who produces the best overall Year K-2 project.

Blake Rhim, Arden Anglican School, *Can I make a coin float on water?*

Rural Primary Young Scientists

The Rural Primary Young Scientist award is presented to the best overall Year 3-6 project from a student attending a school in a rural or regional area.

Kushmi Jayaratne and Lotem Rotman, Armidale City Public School, *Ready Set Ant*

Primary Young Scientist

The Primary Young Scientist award is presented to the student who produces the best overall Year 3-6 project.

Kaelyn Chik, PLC Sydney, *Ocean Acidification and Its Effect on Octopuses*

Grand Awards - Secondary

Rural Young Scientist of the Year Award

PASSIONATELY CURIOUS

The Rural Young Scientist of the Year is awarded to the best overall Year 7-12 project from a student attending a school in a rural or regional area.

Holly Bennett, Kinross Wolaroi School*, Reproductive Rate of Maiden Ewes and the Relationship with Liveweight at Mating and Birth Type*

Young Scientist of the Year

Awarded to the overall best project from across all categories.

Young Scientist of the Year - Equal 2nd Place

Thea Barron, Lambton High School, ***Impact of our shorelines on the fragmentation of microplastics***

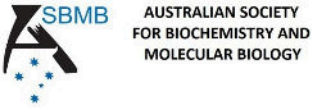
Noah Riva, Barrenjoey High School, ***Spatial Heterogeneity of Surface Water PFAS Levels along the Snowy River, from its Source to Lake Jindabyne***

2025 Young Scientist of the Year

Michaela Loukas, Marist Catholic College Penshurst,

Assessing the Accuracy and Interpretability of a Recurrent Neural Network for Breast Cancer Classification and Molecular Subtyping using Ribonucleic Acid Sequencing Data

With thanks and appreciation to our 2025 sponsors



STA NSW YOUNG SCIENTIST

Young Scientist Awards

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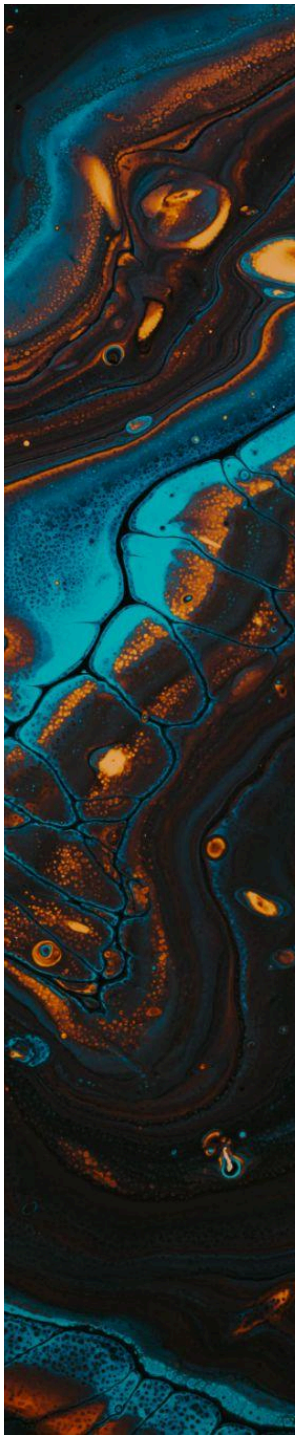

The Young Scientist Awards are a major project of the Science Teachers Association of New South Wales