

2017 Newcastle Science and Engineering Challenge Program Report

Report Prepared by
Brian Atkins Regional Chair and Paul Griffiths Deputy Regional Chair
On behalf of the Newcastle Challenge Coordinating Committee



2017 National Final Champions Representing New South Wales
All Saint's College St Peter's Campus Maitland



With assistance of 17 Rotary Clubs of the Greater Newcastle Area District 9670 in
Newcastle, Lake Macquarie, Lower Hunter and Port Stephens areas

THE SCIENCE AND ENGINEERING CHALLENGE



The Science and Engineering Challenge is designed to inspire year 9-10 students to consider future STEM careers by involving them in a series of fun and engaging science and engineering-based activities that would not be available in a school classroom. These activities themselves involve a wide range of STEM challenges including building model bridges, planning electrical supply grids, and even building functional catapults.

NEWCASTLE SCIENCE AND ENGINEERING CHALLENGE

This community-based program commenced in Newcastle in 2001 and now in its 17th consecutive year with the continued strong partnership between The University of Newcastle's Faculties of Science, Engineering and Built Environment, and Rotary International's District 9670 Rotary Clubs as community partners from Newcastle, Lake Macquarie, Lower Hunter and Port Stephens areas.

ROTARY INTERNATIONAL DISTRICT 9670, 2017 REGIONAL CHALLENGES

Newcastle Challenge - Western Plains Challenge Dubbo

Upper Hunter Challenge Muswellbrook

Please note the winners of these Regional Challenges and other Regional Challenges from throughout NSW competed in the 2017 NSW State Final Super Challenge which was hosted, organised, coordinated and funded by the 2017 Newcastle Science and Engineering Challenge Coordinating Committee.

NEWCASTLE SCIENCE AND ENGINEERING CHALLENGE COORDINATING TEAM 2017

- Newcastle Regional Chair for 2017 Newcastle Challenge Series, 2017 NSW Super Challenge Series and Discovery Days 2017 Brian Atkins Past District Governor Rotary District 9670 (Rotary Club of Waratah)
 - Deputy Newcastle Regional Chair Coordinating Committee for 2017, Newcastle Challenge Series the 2017 NSW Super Challenge Series and Discovery Days 2017 Paul Griffiths (Rotary Club of Williamtown)
 - The University of Newcastle, Faculty of Engineering and Built Environment and Director of National Challenge Operations Dr. Terry Burns
 - Challenge Event Manager Michael Cassey
 - The University of Newcastle, Past Head, School of Mathematical and Physical Sciences Professor John O'Connor
 - Engineers Australia and Rotary Representative, Earl Heckman (Rotary Club of Maitland) 2017 Discovery Days Coordinator for Maitland, Avondale, Newcastle, Cessnock and Port Stephens.
 - Rotary Representative from Rotary Club Newcastle Enterprise Bob Aus and Newcastle Challenge Treasurer
 - Rotary Representative from Rotary Club of Newcastle Enterprise Keith Finnie and Newcastle Challenge Secretary
 - The Challenge Team Volunteer and Friend of the Rotary Club of Belmont Fiona Hilliar
 - Rotary Representative from Rotary Club of Newcastle Enterprise Margaret McLachlan
 - Rotary Representative from Rotary Club of Williamtown Graham Giddey
 - Rotary Representatives Laurie McGrath and Clarice Hamling the Rotary Club of Wallsend-Maryland
 - Valley Homes Director and Community Representative Craig Baumann
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2017 NEWCASTLE CHALLENGE SERIES

VENUE AND DATES

The 2017 Newcastle Science and Engineering Challenge was held for the fifth time at The Forum Sports and Aquatic Centre at The Newcastle University, University Drive, Callaghan NSW on Monday 31 July to Friday 4 August 2017. This venue again proved to be very successful with 60 high schools invited to participate.



38 high schools competed over the five Challenge days with a total number of 1,032 students. A total of 72 teachers, 6 guests, 155 event staff from the University Challenge Team, Rotarians, partners and volunteers, with a total of 1,273 people, attended these events.

FULL DAY ACTIVITIES: Catapult, Gold Fever, Flat Pack

HALF DAY ACTIVITIES: Stringways, Electra City, Grasping at Straws, Confounding Communications, Turbine

PARTICIPATING SCHOOLS

DAY 1: 31 July 2017: Port of Newcastle Science and Engineering Challenge

Warners Bay High School, Wyong Christian School, Lambton High School, Macquarie College, Dungog High School, Whitebridge High School, Bishop Tyrell Anglican College, St. Mary's Catholic College

DAY 2: 1 August 2017: Laing O'Rourke Newcastle Science and Engineering Challenge

All Saint's College St Peter's Campus, Maitland Grossmann High School, All Saint's College St Joseph's College, Maitland Christian School, Hunter School of the Performing Arts, St Clemente High School, Callaghan College Waratah Technology Campus

DAY 3: 2 August 2017: Newcastle Science and Engineering Challenge

Maitland High School, St Paul's High School Booragul, Hunter Christian School, Mount View High School, Tomaree High School, St Pius X High School, Merewether High School, Rutherford Technology High School

DAY 4: 3 August 2017: Dolleina Newcastle Science and Engineering Challenge

Medowie Christian School, St Phillip's Christian College Waratah, Avondale School, Kotara High School, Cardiff High School, Callaghan College Wallsend Campus, Belmont High School, Morisset High School

DAY 5: 4 August 2017: Valley Homes Newcastle Science and Engineering Challenge

Belmont Christian College, Lakes Grammar College, Newcastle Grammar School, Newcastle High School, Northlakes High School, Newcastle Waldorf School, Charlton Christian College

THE WINNERS

Congratulations to the following winning high schools with the highest two schools progressing to the 2017 NSW Science and Engineering Super Challenge (State Final).

Day 1:	Macquarie College	1226.18
Day 2:	ASC St Peter's Campus Maitland	1403.23
Day 3:	St Pius X High School Adamstown	1372.77
Day 4:	St Philip's Christian College Waratah	1154.81
Day 5:	Belmont Christian College	1281.77



2017 NSW SUPER CHALLENGE (STATE FINAL) IN NEWCASTLE

The **2017 NSW Super Challenge (State Final)** was held at The Forum Sports and Aquatic Centre at The Newcastle University, Callaghan on Tuesday 15, Wednesday 16 and Thursday 17 August. *A special thank you to Chris Dale and the staff of The Forum Sports and Aquatic Centre for hosting our Newcastle Challenge program 2013-2017, our fifth year.*



A total of 26 High Schools from throughout regional New South Wales qualified for the NSW State Final Super Challenge. Teams did not know in advance which activity they were to attempt. The activities were drawn out by ballot at the beginning of each Challenge day. A total of 58 teachers, 11 invited guests, 81 event staff from the University Challenge Team, Rotarians, partners and volunteers, with a total of 890 people attending this event. The schools engaged in the following activities with a total of 740 students selected to compete in eight activities.

FULL DAY ACTIVITIES: Catapult, Gold Fever, Flat Pack,

HALF DAY ACTIVITIES: Stringways, Electra City, Grasping at Straws. Confound Communications, Turbine

PARTICIPATING SCHOOLS

DAY 1

Henry Lawson High School, Emmaus Christian School, MET School, Koorringal High School, Kirrawee High School, Oxley High School, Danthonia and Glen Innes High Schools, Frensham School, Orange and Canobolas High Schools

DAY 2

Lumen Christi College and St Patrick's, Macquarie Anglican Grammar School, South Grafton High School, Pittwater High School, Xavier College, William Carey Christian School, St Columba Anglican School, Wingham High School, All Saints College St Peter's College Maitland

DAY 3

Narrabri High School, Scone High School, Central Coast Grammar School, St Patrick's College, Keira High School, Goulburn High School, Shore School, St Pius X High School

THE WINNERS

Congratulations to the following schools:

Day 1:	Danthonia School and Glen Innes High School	1349.92
Day 2:	All Saints College St Peter's Campus Maitland	1393.98
Day 3:	Shore School	1216.70



Congratulation to All Saints College St Peter's Campus Maitland as they were invited to compete in the Science and Engineering Challenge 2017 National Final in Dubbo, New South Wales on 3 November.

SCIENCE AND ENGINEERING CHALLENGE 2017 NATIONAL FINAL AT DUBBO SHOWGROUND NSW



After 99 days of competition around Australia that reached 18,975 high school students from 732 schools, the 2017 National Final of Science and Engineering Challenge was held at Dubbo Showground on Friday 3 November 2017.



A total of eight high schools from all over Australia qualified for the National Final. Teams did not know in advance which activities they were to attempt. The activities were drawn by ballot at the beginning of the Challenge day. The schools engaged in the following eight activities for the National Final, with 247 students competing.

FULL DAY ACTIVITIES: Gold Fever (The Bridge), Catapult, Hover Frenzy and Eco-Habitech

HALF DAY ACTIVITIES: Confounding Communications, Flight, Stringways and the Great Tea Race

CONGRATULATIONS TO THE PARTICIPATING SCHOOLS

All Saints College St Peter's Campus Maitland (NSW) 1174.15, Launceston Christian School (TAS) 1072.64, Bendigo South East College (VIC) 984.25, Riverside Christian College (SA) 912.65, Darwin Middle School (NT) 753.15, Temple Christian College (SA) 724.20, Hale School (WA) 677.86 and Macquarie Anglican Grammar Dubbo (NSW) 657.96



**THE WINNING SCHOOL OF THE SCIENCE AND ENGINEERING CHALLENGE
2017 NATIONAL FINAL REPRESENTING NSW AND NEWCASTLE
ALL SAINTS COLLEGE ST PETER'S CAMPUS MAITLAND – SCORE 1174.15**

THE NATIONAL FINAL INCLUDED:

247 students competed (124 males and 123 females), 24 supporting teachers, 32 event staff that included The University Challenge Team, Sponsors, Rotarians, partners and volunteers with 302 people in total attending the event.

MEDIA ATTENTION:

Facebook social media, Direct Webcast, Radio, Television and Newspapers

VIP ATTENDANCE:

There were 5 VIP's in attendance at the National Final this year



2017 SCIENCE AND ENGINEERING CHALLENGE PROGRAM SPONSORS

We wish to acknowledge the sponsorship and continuing financial support of the following companies and Rotary Clubs who make the Science and Engineering Challenge in Newcastle sustainable.

Port of Newcastle: Principal Partner, Naming Rights Event Sponsor Day 1 Newcastle Challenge

Laing O'Rourke: Principal Partner, Naming Rights Event Sponsor Day 2 Newcastle Challenge

Dolleina Pty Ltd: Principal Partner, Naming Rights Event Sponsor Day 4 Newcastle Challenge

Valley Homes Pty Ltd: Principal Partner, Naming Rights Event Sponsor Day 5 Newcastle Challenge

Orica Limited: Iron Level Activity Sponsor, Newcastle Challenge and three days at the NSW Super Challenge

Maitland City Council: Iron Level Activity Sponsor, Newcastle Challenge and two Days at the NSW Super Challenge

GHD: Iron Level Activity Sponsor, Newcastle Challenge and two days at the NSW Super Challenge

Thales Australia: Iron Level Activity Sponsor Newcastle Challenge

Australian Defence Force Recruiting: Supported the Newcastle Challenge and NSW Super Challenge

Rotary International District 9670: 2017 NSW Super Challenge Event Sponsor

Rotary Club Toronto Inc: Iron Level Event Sponsor, Newcastle Challenge

Rotary Club Williamstown Inc: Iron Level Event Sponsor, Newcastle Challenge

Rotary Club Morisset Inc: Iron Level Event Sponsor, Newcastle Challenge

Rotary Club of Raymond Terrace Inc: Iron Level Event Sponsor, Newcastle Challenge



2017 DISCOVERY DAYS SPONSORS

We wish to acknowledge the sponsorship and continuing financial support of the following companies who make the Discovery Days in Newcastle sustainable:

Port Waratah Coal Services

Daracon Group

Fewzion Pty Ltd

2017 SCIENCE AND ENGINEERING DISCOVERY DAYS PROGRAMS TEAM

Maitland, Avondale, Newcastle, Port Stephens Cessnock and Discovery Days

- Newcastle Regional Chair PDG Brian Atkins (Waratah Rotary Club)
- Deputy Newcastle Regional Chair Paul Griffiths (Williamstown Rotary Club)
- Coordinator, Maitland, Avondale, Newcastle, Port Stephens and Cessnock Discovery Days Earl Heckman (Maitland Rotary Club)
- The University of Newcastle Director of National Challenge Operations Dr Terry Burns
- Challenge Event Manager Michael Cassey
- The University of Newcastle, Helen Beckitt (Maitland Discovery Days)
- The University of Newcastle, Jessica Kearney (Avondale Discovery Day)
- The University of Newcastle, Chris Hendry (Newcastle Discovery Days)
- Committee Member David Jack (Retired Principal of Hamilton Public School)
- Committee Member and Treasurer Bob Aus (Newcastle Enterprise Rotary Club)
- Committee Member Margaret McLachlan (Newcastle Enterprise Rotary Club)
- Committee Member David Thomas (Williamstown Rotary Club)
- Committee Member Jennifer Wood (Retired School Teacher)
- Committee Member Moira Sullivan (Retired School Teacher)

2017 NEWCASTLE SCIENCE AND ENGINEERING CHALLENGE DISCOVERY DAYS PROGRAM

General Statement:

This year we conducted 19 Discovery Days, with a total of 97 schools, 144 team entries, and a total of 3,647 primary school students participating.

Administration:

Our thanks are extended to all our Committee for another outstanding year, and for their valuable support. Moira Sullivan and Jenny Wood supported by David Jack provided excellent liaison with the primary and high schools. Terry Burns' Challenge Team did an excellent job throughout the 19 days of competition. Sincere thanks also to Brian and Jo Marsden for their valuable support throughout the program.



Unfortunately, David Jack and Margaret McLachlan are resigning from the committee having been involved from the beginning of the Discovery Days program in 2008. Best wishes for the future and thank you for your many years of service.

Notices were sent to schools during February 2017. It was agreed the committee needs to send invitations to primary schools earlier next year and need to develop a better system of obtaining completed registration forms from participating schools.

Competition days:

The feedback from the school teachers was extremely positive, the trophies were very well received, and the Science show each day was a highlight. Generally, the participating high schools was excellent, and students appeared to enjoy the experience.

The following is a summary of how each of these events were conducted:

Maitland Discovery Days at Maitland Grossmann High School, 7 to 11 August 2017:

22 primary schools, 37 school teams participated; a total of 958 primary school students.

Two schools and three teams cancelled at very short notice.

Venue: Maitland Grossmann High School proved to be a good venue.

For the activities selected, there was just adequate floor space available. It was a great benefit being allowed to leave all the equipment set-up overnight and the maintenance staff was most helpful.

Maitland, East Maitland, Maitland Sunrise and Williamtown Rotary Clubs provided the volunteers required.

Thank you everyone.



Lake Macquarie Discovery Days at Avondale School, 16 and 17 August 2017:

11 primary schools, 17 school teams participated; a total of 419 primary school students.

Venue: Avondale School was an excellent venue.

For the activities selected, there was ample floor space available. A fair effort was required to place floor mats for each activity to protect polished floor. Fortunately, all equipment and floor mats did not have to be packed up overnight. The school's administration staff was most helpful. Table hire was necessary due to NSW S&E Super Challenge being conducted on the same dates.

Morisset and Toronto Sunrise Rotary Clubs provided the volunteers required.

Many thanks.

Newcastle Discovery Days at St Therese's Primary School New Lambton, 4 to 8 September 2017:

25 primary schools, 39 school teams participated; a total of 1,013 primary school students.

Venue: St Therese's Primary School Hall was an excellent venue.

For the activities selected, there was ample floor space available. It was a great benefit being allowed to leave all equipment set-up overnight and the administration staff was most helpful.

Belmont, Maitland, Newcastle Enterprise, Wallsend-Maryland, Waratah and Williamtown Rotary Clubs provided the volunteers required.

Again, many thanks to the Rotarians.

Port Stephens Discovery Day at Tomaree High School, 21 September 2017:

Four primary schools, six school teams participated; a total of 166 primary school students.

Venue: Tomaree High School again proved to be an excellent venue for the activities selected, and there was ample floor space available. Past District Governor Don Whatham (Nelson Bay Rotary Club) accepted the responsibility for conducting this event and provided all catering supplies and volunteers. Nelson Bay Rotary Club provided the volunteers required.



Newcastle Discovery Days at St Mary's Catholic College Gateshead, 16 to 18 October 2017:

18 Primary Schools, 24 school teams participated; a total of 608 primary school students.

Venue: St Mary's High School Hall was an excellent venue for the activities selected and there was ample floor space available. It was a great benefit being allowed to leave all equipment set-up overnight. The school's administration staff was most helpful.

Belmont, Charlestown, Maitland and Williamtown Rotary Clubs provided the volunteers required.

Cessnock Discovery Days at Mount View High School, 24 to 26 October '17:

14 primary schools, 21 school teams participated; a total of 483 primary school students.

Venue: Mount View High School Hall was a good venue for the activities selected and there was just ample floor space available. It was a great benefit being allowed to leave all equipment set-up each night. The administration staff was most helpful.

Cessnock, East Maitland, and Maitland Rotary Clubs provided the volunteers required. Thank you.

Finally, the Discovery Day Program was a very big challenge this year as it increased from 16 days to 19 days and included some days with nine schools participating. Our thanks must also be given to the BBQ lunch helpers, mainly from Rotary Clubs who arrived to cook and serve the BBQ lunches. This also included teachers and retired teachers who helped.

In conclusion, again, we acknowledge with thanks the continuing financial sponsorship from Port Waratah Coal Services, Daracon Group and Fewzion Pty Ltd.

Report presented by Earl Heckman - 10 November 2017

On behalf of the 2017 Newcastle Science and Engineering Challenge Coordinating Committee, I wish to extend a special congratulation to Earl Heckman (Program Coordinator), David Jack, (Assistant Program Coordinator), Bob Aus (Treasurer), Dr Terry Burns and the University of Newcastle's Challenge Team and the Discovery Days Committee for presenting and running a highly successful Discovery Days program in 2017.

Brian Atkins - Newcastle Regional Chair

ACKNOWLEDGEMENTS

Our 2017 Challenge year commenced with the Newcastle Challenge Dinner and Presentation Night. We extend our grateful appreciation to President Meredith How and the members and partners of the Rotary Club of Newcastle Enterprise for again hosting the Newcastle Challenge Dinner at Wests Mayfield on 25 July. This was a fantastic evening of *Rotary in Action* when we, with the support of the Challenge Team from the University of Newcastle, presented our exciting 2017 Newcastle Challenge program and acknowledgement of our 2017 Challenge Sponsors. Our 75 guests that attended included Rotarians, partners and sponsors.

We acknowledge with thanks our guest speaker Mr. Paul Jeans, Chancellor from The University of Newcastle and a proud fourth generation Novocastrian who presented his Keynote Address. Mr. Jeans is a Mechanical Engineer having graduated from the Newcastle University College of the University of N.S.W, served as a Council Member, a Fellow of the University of Wollongong and a long time Director and Honorary Governor of the Warren Centre of advanced Engineering at Sydney University. He delivered an interesting and inspirational address on his lifetime experiences highlighting his extensive knowledge on Newcastle, and taking many questions. As always, the table experiment presented by Dr Terry Burns, *Cupid Calamity* provided great Rotary fellowship and a huge challenge to all our guests.



Also present were representatives from our 2016 National Science and Engineering Challenge Final winning high school, St. Mary's Catholic College, Gateshead. The students were worthy winners of the Rotary Club of Waratah's Newcastle Science and Engineering Challenge Championship Trophy for the highest scoring high school competing at the 2016 Newcastle Challenge. This perpetual trophy was presented by Madeleine Atkins, President of the Rotary Club of Waratah. The school was represented by their Headmaster Mr. Larry Keating, supervising science teacher Shane Able and Bill Gudgeon.

Brian Atkins made a presentation to St. Mary's high school, Gateshead of the Past Rotary District Governor Bob Stent's District 9670 Memorial Trophy on behalf of Margaret Stent, for the highest scoring high school from District 9670 competing at the 2016 NSW State Final of the Science and Engineering Challenge and progressing to the 2016 National Final.

Listed are our Sponsors and supporters for the 2017 Newcastle Science and Engineering Challenge program. Some of whom were present at our dinner and we would sincerely thank them for their support this year.

1. Port of Newcastle: Sarah Kiely, Peter Coventry, Wendy West and Andrew Wood
2. Laing O'Rourke Australia: Gemma Burgess and James Kennedy
3. Valley Homes: Mac Campbell and Craig Baumann
4. Dolleina Pty Ltd: Disability Service Providers : Alexander Tickle and Dollina Renton
5. GHD: Belinda Pigram, Emma Neeves and David Sparkes
6. Maitland City Council: Mayor Peter Blackmore, Matt vanderWall and Carlee Mackay
7. Orica Australia Pty Ltd: Brennan Borserio, Andre Hoffman
8. Thales Australia: David McKinnon and Sarah Yuen
9. Australian Defence Force Recruiting: Leut. RAN William Carter and Jennifer Marshall
10. Rotary International District 9670: PDG Steve Jackson
11. Rotary Club of Toronto Inc: President Timothy Rossington
12. Rotary Club of Williamstown Inc: President Geoffrey Hamilton
13. Rotary Club of Raymond Terrace Inc: President John Chambers
14. Rotary Club of Morisset Inc: President John Rodstrom



The 2017 Newcastle Science and Engineering Challenge was held at the Forum Sports and Aquatic Centre. Team Leader Chris Hendry ran this major event and after his full evaluation a high 9/10 rating was achieved. Daily Key Performance Indicators show 38 high schools competed over the 5 Challenge days noting 2 high schools failed to attend. Both schools were Invoiced for \$150. As the Challenge's community partner in Newcastle with the UON Challenge team, our committee's organizational structure worked well and was outstanding. Thanks to our Newcastle Challenge Team members, our activity supervisors, activity assistants and Challenge Team members Chris Hendry and Michael Cassey.

The NSW Super Challenge (State Final) again was held in Newcastle at the Forum Sports and Aquatic Centre. Team Leader Chris Hendry ran this major event and after his full evaluation a great 9/10 rating was achieved. As stated above, both teams worked exceptional well together. Thanks, are extended to our Newcastle Challenge Team, Dr Terry Burns, Chris Hendry, Michael Cassey and UON staff, and our activity supervisors and assistants for their great support.

I wish to personally thank all our sponsors and their representatives, Past District Governor Steve Jackson, District Governor Helen Ryan, District Governor Elect Brian Coffey, District Governor Nominee Graeme Hooper and Sue. To our supporting Rotarians and partner from the Rotary Clubs of the Greater Newcastle area, thank you for helping as activity coordinators and activity assistants. This greatly reflects on the outstanding success of our 2017 Newcastle Challenge and Discovery Days programs. It is greatly appreciated. *Newcastle remains the Epicentre of the National Challenge Program.*

Footnote: As the Newcastle Regional Chair, I wish to extend to our Deputy Regional Chair Paul Griffiths, Secretary Keith Finnie, Treasurer Bob Aus and the hardworking members of our fantastic Newcastle Science and Engineering Coordinating and Discovery Days Teams, and to Dr Terry Burns and the Newcastle University Challenge Team, my grateful appreciation for a fantastic 2017 Newcastle Challenge year. **Brian Atkins**

2018 NEWCASTLE SCIENCE AND ENGINEERING CHALLENGE PROGRAM DATES

Event: Newcastle Science and Engineering Challenge

Date: Monday 30 July to Friday 3 August

40 High Schools competing at the Forum Sports and Aquatic Centre, The University of Newcastle

Event: NSW State Final 2018 Science and Engineering Super Challenge

Date: Tuesday 28 August to Thursday 30 August

24 High Schools competing at the Forum Sports and Aquatic Centre, The University of Newcastle

Event: National Final 2018 Science and Engineering Challenge in Darwin, Northern Territory:

Date: 26 October 2018, the venue in Darwin is expected to be Charles Darwin University.

Eight winning high schools from across Australia which includes the wild card entry from Darwin will compete at the 2018 National Final in Darwin

Brian Atkins

Newcastle Regional Chair

District Governor 2013-2014 for

District 9670, Rotary Club of Waratah

Paul Griffiths

Deputy Newcastle Regional Chair

Rotary Club of Williamtown