

# Andrew Gunn

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## Education

### Department of Earth & Environmental Science, University of Pennsylvania

*Doctor of Philosophy*

GPA: 3.91. Advisor: Douglas Jerolmack. Thesis: Scale-dependent coupling between aeolian flow & form.

Philadelphia, U.S.A  
August 2016 – March 2021

### Institute for Marine & Antarctic Studies, University of Tasmania

*Bachelor of Marine Science, Honours*

GPA: 4.0. Advisor: Maxim Nikurashin. Thesis: The role of mixing and wind for the meridional overturning circulation and ocean carbon.

Hobart, Australia  
February 2015 – December 2015

### School of Mathematics and Statistics, University of Melbourne

*Bachelor of Science*

GPA: 3.1. Major: Applied Mathematics. Minor: Ocean & Atmosphere Science.

Melbourne, Australia  
February 2012 – December 2014

## Fellowships & Appointments

### Lecturer in Physical Geography

*School of Earth, Atmosphere & Environment, Monash University*

Research: Geomorphology, sediment comminution, geophysical fluid dynamics.  
Methods: experiments, fieldwork, computer simulations, remote sensing, theory.

Melbourne, Australia  
March 2022 (expected) – Ongoing

### Postdoctoral Fellow

*Geological Sciences, Stanford University*

Advisor: Mathieu Lapôtre. Research: Martian aeolian processes, turbulent stratified flows, geomorphology, sediment comminution.  
Methods: experiments, fieldwork, computer simulations, remote sensing, theory.

Stanford, U.S.A  
April 2021 – January 2022 (expected)

### Benjamin Franklin Fellow

*Earth & Environmental Science, University of Pennsylvania*

Advisor: Douglas Jerolmack. Research: atmospheric boundary layer (ABL) and dune field interactions, sediment transport measurement techniques, continental slope failure & rheology. Methods: experiments, fieldwork, remote sensing, theory.

Philadelphia, U.S.A  
April 2016 – March 2021

### Research Fellow

*Earth & Environmental Science, University of Pennsylvania*

Advisor: Irina Marinov. Research: GFDL GCM Weddell Sea convection dynamics, phytoplankton functional-type ecology models.  
Methods: computer simulations.

Philadelphia, U.S.A  
June 2016 – August 2016

### Tsuneichi Fujii Scholar

*Graduate School of Environmental Science, University of Hokkaido*

Advisors: Masakazu Yoshimori, Maxim Nikurashin. Research: Meridional overturning circulation (MOC) polynomials, MITgcm mixing and westerly MOC sensitivity testing, carbon-phosphate PDE coupling to MOC polynomials applied to the Last Glacial Maximum.  
Methods: theory, computer simulations.

Sapporo, Japan  
August 2015 – November 2015

### Australian Research Council Climate System Science Scholar

*Institute for Marine & Antarctic Studies, University of Tasmania*

Advisors: Maxim Nikurashin, Peter Strutton. Research: Semi-analytical MOC coupling with biogeochemical parameterisation model sensitivity and dynamics testing. Methods: theory, computer simulations.

Hobart, Australia  
November 2015 – February 2015

## Publications

1. **Gunn, A.**, P. Schmutz, M. Wanker, D. Edmonds, R. Ewing, and D. Jerolmack, 2020, Macroscopic flow disequilibrium over aeolian dune fields, *Geophysical Research Letters* ([doi:10.1029/2020GL088773](https://doi.org/10.1029/2020GL088773)).
2. Gadal, C., C. Narteau, R. Ewing, **A. Gunn**, D. Jerolmack, B. Andreotti, P. Claudin, 2020, Spatial and temporal development of the dune instability, *Geophysical Research Letters* ([doi:10.1029/2020GL088919](https://doi.org/10.1029/2020GL088919)).
3. **Gunn, A.**, M. Wanker, N. Lancaster, D. Edmonds, R. Ewing, and D. Jerolmack, 2021, Circadian rhythm of dune-field activity, *Geophysical Research Letters* ([doi:10.1029/2020GL090924](https://doi.org/10.1029/2020GL090924)).
4. Seiphoori, A., **A. Gunn**, S. Kosgodagan Acharige, P. Arratia and D. Jerolmack, 2021, Tuning sedimentation through surface charge and particle shape, *Geophysical Research Letters* ([doi:10.1029/2020GL091251](https://doi.org/10.1029/2020GL091251)).

*In review*

5. **Gunn, A.** and D. Jerolmack, Conditions for aeolian transport in the Solar System, *Nature Astronomy* (minor revisions; [EarthArXiv:1872](https://arxiv.org/abs/1872)).
6. **Gunn, A.**, G. Casasanta, L. Di Liberto, F. Falcini, N. Lancaster and D. Jerolmack, What sets aeolian dune height? *Nature Communications* (minor revisions; [EarthArXiv:2379](https://arxiv.org/abs/2379)).
7. **Gunn, A.**, A. East and D. Jerolmack, 21<sup>st</sup>-century stagnation in sand-sea activity. *Nature Communications* (minor revisions).
8. **Gunn, A.**, L. Rubanenko, M. Lapôtre, Accumulation of windblown sand in impact craters on Mars. *Geology* (submitted).

9. L. Rubanenko, **A. Gunn**, L. Fenton, R. Ewing, M. Lapôte, Global morphometrics of barchan dunes on Mars revealed by an artificial neural network. *Geology* (submitted).

**Seminars, Invited Talks & Conference Proceedings** (underline denotes student mentee, \*denotes scheduled)

*Invited Talks & Seminars*

1. **University of California – Santa Cruz**, Earth & Planetary Sciences Seminar, 26 October 2021, “Wind-blown dunes in the Solar System”.
2. **Monash University**, School of Earth, Atmosphere and Environment Seminar, 25 October 2021, “Deciphering atmosphere-surface interactions in arid landscapes on Earth and Mars”.
3. **Texas A&M University**, Geology & Geophysics Seminar, 19 March 2021, “Scale-dependent coupling between aeolian flow & form”.
4. **University of Pennsylvania**, Earth & Environmental Sciences Thesis Defense Seminar, 5 March 2021, “Scale-dependent coupling between aeolian flow & form”.
5. **International Society for Aeolian Research**, Virtuaeolian Seminar Series, 8 January 2021, “Scale-dependent coupling between aeolian flow & form”.
6. **University of Pennsylvania**, Physics & Astronomy ‘Disordered Colloids, Nanoparticles, Atoms and Particulates’ Seminar, 23 October 2020, “Tuning sedimentation through surface charge and particulate shape”.
7. **University of Pennsylvania**, Physics & Astronomy ‘Disordered Colloids, Nanoparticles, Atoms and Particulates’ Seminar, 25 June 2020, “Conditions for aeolian transport across the Solar System”.
8. **Princeton University**, Environmental Fluid Mechanics Seminar, 20 May 2019, “Land-atmosphere coupling at White Sands Dune Field, NM”.
9. **University of Pennsylvania**, BenTalks, 17 March 2017, “Turbulence suppresses glacial cycles”.
10. **University of Pennsylvania**, Earth & Environmental Science Lunch Seminar, 12 September 2016, “Diapycnal mixing inhibits ocean carbon storage”.
11. **University of Tasmania**, Institute for Marine & Antarctic Studies Thesis Defense Seminar, 24 November 2015, “The role of mixing and wind for the meridional overturning circulation and ocean carbon”.
12. **Australian National University**, Geophysical Fluid Dynamics Seminar, 24 November 2015, “A comparison of the role of mixing and wind for the meridional overturning circulation in theory and the MITgcm”.
13. **University of Hokkaido**, Ocean-Atmosphere Climate Dynamics Lecture, 1 September 2015, “The role of ocean mixing and Southern Ocean Westerlies for ocean carbon: theory development and comparison with a GCM”.
14. **Commonwealth Scientific & Industrial Research Organisation (CSIRO)**, Lunch Seminar, 30 July 2015, “Understanding ocean carbon’s response to wind and mixing: a theoretical and modelled approach”.
15. **Institute for Marine & Antarctic Studies**, Physical Oceanography Seminar, 11 February 2015, “The role of the deep ocean ventilation for the carbon uptake and storage in the ocean”.

*Conference Presentations*

1. **A. Gunn**, D. Jerolmack (2021) Constraining candidate surface sediment on planetary bodies using theory for particle attrition at the aeolian transport threshold, *American Geophysical Union Fall Meeting*, **Invited Oral Session**.
2. **A. Gunn**, M. Lapôte, (2021) Accumulation rates of aeolian sediments in martian impact craters, *American Geophysical Union Fall Meeting*, **Oral Session**.
3. M. Hasson, **A. Gunn**, M. Lapôte, (2021) Channel and channel-fill deposits of an unvegetated distributary fluvial system: Implications for Jezero crater, Mars, *American Geophysical Union Fall Meeting*, Poster Session.
4. L. Rubanenko, **A. Gunn**, S. Pérez-López, J. Schull, M. Lapôte, L. Fenton, R. Ewing, (2021) Global surface winds inferred from barchan dunes on Mars using a convolution neural network, *American Geophysical Union Fall Meeting*, Oral Session.
5. **A. Gunn** (2021) Geometry of Earth’s giant dunes, “A new classification for aeolian landforms” Workshop, **Invited Oral Session**.
6. **A. Gunn**, M. Wanker, N. Lancaster, D. Edmonds, R. Ewing, D. Jerolmack, (2021) Circadian rhythm of dune-field activity, *Australian Earth Sciences Convention*, **Oral Session**.
7. A. Seiphoori, **A. Gunn**, S. Kosgodagan Acharige, P. Arratia, D. Jerolmack, (2021) Tuning sedimentation through surface charge and particle shape, *American Physical Society March Meeting*, Oral Session.
8. **A. Gunn**, D. Jerolmack, (2020) Conditions for aeolian transport in the Solar System, *American Geophysical Union Fall Meeting*, **Oral Session**.
9. K. Cho, **A. Gunn**, D. Jerolmack, (2020) Understanding formative winds of intracrater aeolian dunes on Mars, *American Geophysical Union Fall Meeting*, Poster Session.
10. **A. Gunn**, G. Casasanta, F. Falcini, D. Jerolmack, (2020) Long-term dune geometry bounded by geology and climate, *American Geophysical Union Fall Meeting*, **Oral Session**.
11. C. Gadal, C. Narteau, R. Ewing, **A. Gunn**, D. Jerolmack, B. Andreotti, P. Claudin, (2020) Spatial and temporal development of the dune instability at White Sands Dune Field, USA, 6<sup>th</sup> *International Planetary Dunes Workshop*, Online Poster.
12. **A. Gunn**, N. Lancaster, R. Ewing, M. Wanker, D. Edmonds, F. Falcini, G. Casasanta, D. Jerolmack, (2019) Self-building landscapes: Sand seas grow by steering climate, *American Geophysical Union Fall Meeting*, **Oral Session**.
13. R. Fetell, **A. Gunn**, D. Jerolmack, (2019) Phase-space of sediment failure spanned by packing-fraction and grain-size, *American Geophysical Union Fall Meeting*, Poster Session.
14. **A. Gunn**, R. Ewing, M. Wanker, D. Edmonds, P. Schmutz, D. Jerolmack, (2019) Internal Boundary Layer Induced by Dune-Field Roughness, *American Physical Society Division of Fluid Dynamics*, **Oral Session**.
15. **A. Gunn**, D. Jerolmack, (2019) Dune geometry extraction from DEMs, *EarthCube, OpenTopography, U. Potsdam Point-cloud Workshop*, **Oral Session**.
16. **A. Gunn**, M. Wanker, D. Edmonds, R. Ewing, D. Jerolmack, (2019) How to make a dust storm: *In situ* observations at White Sands, New Mexico, *Australian Meteorological & Oceanographic Society Conference*, **Oral Session**.
17. D. Jerolmack, M. Houssais, B. Ferdowsi, C. Ortiz, N. Deshpande, **A. Gunn**, (2019) Phase transitions in geophysical flows, *European Geosciences Union General Assembly*, Oral Session.
18. **A. Gunn**, D. Jerolmack, (2019) Turbidity Current Rheology, *Northeast Complex Fluids & Soft Matter Symposium*, Poster Session.
19. **A. Gunn**, M. Wanker, K. Cheffer, D. Edmonds, R. Ewing, D. Jerolmack, (2018) The Unsung Aeolian Movers and Shakers: Atmospheric Stability and Humidity, *American Geophysical Union Fall Meeting*, **Oral Session**.
20. **A. Gunn**, J. Daif, D. Jerolmack, (2018) Experimental Turbidity Current Onset: Breaching Front Rheology, *American Geophysical Union Fall Meeting*, **Oral Session**.

21. **A. Gunn**, D. Jerolmack, (2018) Experimental Turbidity Current Onset: Breaching Front Rheology, *Binghamton Geomorphology Symposium*, Poster Session.
22. **A. Gunn**, M. Wanker, D. Edmonds, R. Ewing, D. Jerolmack, (2018) From geostrophic to grain: momentum transfer in aeolian systems, *International Conference on Aeolian Research*, **Oral Session**.
23. **A. Gunn**, D. Jerolmack, (2018) Coupled climate and dune feedbacks, *Wolman Club*, Poster Session.
24. **A. Gunn**, D. Jerolmack, (2018) Turbidity Current Rheology, *Northeast Complex Fluids & Soft Matter Symposium*, Poster Session.
25. **A. Gunn**, D. Jerolmack, D. Edmonds, R. Ewing, M. Wanker, S. David, (2017) Connecting meteorology to surface transport in aeolian landscapes: Peering into the boundary layer with Doppler lidar, *American Geophysical Union Fall Meeting*, **Oral Session**.
26. **A. Gunn**, D. Jerolmack, (2017) Diurnal Ekman layer cycles at White Sands, New Mexico observed with Doppler lidar, *American Physical Society Division of Fluid Dynamics*, **Oral Session**.
27. **A. Gunn**, D. Jerolmack, (2017) The role of diurnal surface heating for dune migration in White Sands, New Mexico, *International Association of Mathematical Geosciences*, Lightning Oral Session.
28. **A. Gunn**, D. Jerolmack, (2017) The role of diurnal surface heating for dune migration in White Sands, New Mexico, *International Association of Mathematical Geosciences*, Poster Session.
29. **A. Gunn**, D. Jerolmack, (2017) Diurnal atmospheric stability cycles control transport at White Sands, New Mexico, *Amtrak Club*, Poster Session.
30. M. Nikurashin, **A. Gunn**, (2017) Sensitivity of the ocean overturning circulation to wind and mixing: theoretical scalings and global ocean models, *European Geosciences Union General Assembly*, Oral Session.
31. **A. Gunn**, D. Lee, P. Arratia, D. Jerolmack, (2017) Geophysical flows: 2D turbulence, lagrangian coherent structures, and particles, *Exxon Mobil Presentation*, Poster Session.
32. **A. Gunn**, I. Marinov, M. Nikurashin, (2016) Novel biogeochemical theory predicts ocean carbon reservoir response to changes in MOC strength and diapycnal mixing, *American Geophysical Union Fall Meeting*, Poster Session.
33. I. Marinov, A. Cabre, **A. Gunn**, A. Gnanadesikan, (2016) Tropical teleconnections via the ocean and atmosphere induced by Southern Ocean deep convective events, *American Geophysical Union Fall Meeting*, Poster Session.
34. **A. Gunn**, M. Nikurashin, (2016) Diapycnal mixing inhibits ocean carbon storage, *Ocean Carbon Biogeochemistry Workshop*, Poster Session.
35. **A. Gunn**, M. Nikurashin, (2015) The role of the Southern Ocean overturning circulation for ocean carbon uptake, *Australian Meteorological & Oceanographic Society Conference*, **Oral Session**.

## Grants, Scholarships & Awards

### Grants

- Named Postdoctoral Scholar, **Mars Data Analysis Program Grant \$632,468**, 2021, National Aeronautics and Space Administration (NASA) awarded to PI **Ryan Ewing**, "Linking crater basin winds, dune morphology, and stratigraphy".
- Named PhD Student, **Petroleum Research Fund, New Directions Grant \$110,000**, 2020, American Chemical Society (ACS) awarded to PI **Douglas Jerolmack**, "Failing just right: The creation of sustained turbidity currents by the collapse of seabed sediments".

### Scholarships

- **International Society of Aeolian Research Elsevier Research Scholarship \$2,250**, 2018, competitive student research grant.
- **Benjamin Franklin Fellowship \$133,000+tuition**, 2016-2021, 4-year stipend for UPenn School of Arts & Sciences PhDs.
- **Tsuneichi Fujii Scholarship \$5,600**, 2015, awarded to 1 graduate student at the universities of Tasmania and Hokkaido for exchange.
- **ARCCSS Summer Student Scholarship \$3,050**, 2015, awarded to 15 Australian students for climate science research projects.

### Awards

- **Schmidt Science Fellowship, Final Selection & Institutional Nomination**, 2020, top ~5% of pre-selected applicants for competitive global STEM-wide postdoctoral fellowship.
- **Greg & Susan Walker Endowment Award \$1,600**, 2019, competitive departmental award used for AGU 2019.
- **SASGov Travel Award \$300**, 2019, competitive UPenn School of Arts & Sciences graduate student award.
- **GAPSA Travel Award \$800**, 2019, competitive UPenn graduate student award.
- **UNAVCO Point Cloud Travel Award \$1,600**, 2019, competitive US-based participant award to attend U. Potsdam workshop.
- **Greg & Susan Walker Endowment Award \$2,000**, 2019, competitive departmental award used for AMOS 2019.
- **GAPSA Travel Award \$800**, 2018, competitive UPenn graduate student award.
- **Binghamton Student Award \$100**, 2018, symposium conveners' cash award for best student contributor.
- **NSF Binghamton Student Travel Award \$800**, 2018, competitive student travel award used for BGS.
- **Greg & Susan Walker Endowment Award \$1,400**, 2018, competitive departmental award used for ICAR.
- **SASGov Executive Stipend \$2,000**, 2017, awarded for research purposes by democratic election.
- **IAMG Student Travel Award \$1,200**, 2017, competitive society award for conference.
- **OCB Student Travel Award \$300**, 2016, competitive travel award for students to the 2016 OCB Workshop.
- **Melbourne Global Scholarship**, 2014, awarded on academic merit for exchange to the London School of Economics.
- **Trinity College Student Coordinator Scholarship**, 2013, awarded to 10 Trinity College students for pastoral care.
- **Peter McPhee Award**, 2013, awarded to 4 students at the University of Melbourne for community service.
- **Trinity College Academic Excellence Award**, 2012, awarded for top grades at the University of Melbourne per semester.
- **Western Australian Government Certificate of Excellence Award**, 2011, awarded for top 1% students in that year.
- **Christ Church Grammar School Academic Scholar Award (x4)**, 2010-2011, A grades for every subject for 2 years.

## Teaching Experience

- 'Earth Surface Processes' GEOL305, **Co-Instructor**, 2021, sediment transport and fluid mechanics lectures, 18 students.
- 'Earth Surface Processes' GEOL305, **Guest Lecturer & Field Teaching Assistant**, 2020, boundary layer section of UPenn class, 20 students to White Sands dunes, administration, mentoring undergraduate field research projects.
- 'Oceanography' GEOL130, **Head Teaching Assistant**, 2020, ~300 students, office-hours, teaching, grading, reviews.
- **University of Pennsylvania Center for Teaching & Learning, Teaching Certificate**, 2018-2021, multi-component accreditation including teaching; experience, observations, philosophy development, and workshops. Workshops participated:
  - 'Engaging diverse audiences in the classroom'

- ‘Supporting students of diverse backgrounds in science’
- ‘Teaching field courses’
- ‘Earth Surface Processes’ GEOL305, **Field Teaching Assistant**, 2019, 15 students to Algodones dunes, administration, mentoring undergraduate field research projects.
- ‘Earth & Life Through Time’ GEOL125, **Teaching Assistant**, 2019, ~200 students, office-hours, guest lecturing, recitations, grading.
- ‘Oceanography’ GEOL130, **Head Teaching Assistant**, 2018, ~300 students, office-hours, teaching, grading, reviews.
- ‘Structured, Active, In-class Learning’ (SAIL) **Teaching Certificate**, 2017, semester-long course on ‘flipped’ undergraduate teaching.
- ‘Oceanography’ GEOL130, **Teaching Assistant**, 2017, ~300 students office-hours, teaching, grading, review sessions.
- GEOL204 ‘Global Climate Change’, **Guest Lecturer**, 2016, ~40 students, climate modelling section of UPenn class.
- **Private, Mathematics, Physics and English Tutor**, 2012-2015, employed as tutor for over 15 students between high school and 1<sup>st</sup> year undergraduate level.
- **MyGuru Ltd., Mathematics Tutor**, Apr 2014–Nov 2015, employed as the primary content creator for online videos for Australian mathematics curricula accessed by thousands of students, as well as other written and in-person tutoring services.

## Outreach & Service

- **American Geophysical Union Fall Meeting, Session Co-Convener**, 13-17 Dec 2021, “Granular and Fluid Physics in Geomorphology”.
- **NSPIRES Grant Panellist**, 2021, NASA.
- **Peer Reviewer**, *Ongoing*, journals: Nature Communications, Science Advances, Geophysical Research Letters, Journal of Geophysical Research: Atmospheres, Journal of Geophysical Research: Earth Surface; book: Treatise on Geomorphology.
- **Good Data Institute, Volunteer**, *Ongoing*, consultant coder for NFPs on analytics and data-practices.
- **Trinity College Alumni Career Event, Science Panelist**, 4 Sept 2020, career mentoring for science undergraduates at my alma mater.
- **American Geophysical Union Fall Meeting, Session Primary Convener**, 1-17 Dec 2020, “Granular and Fluid Physics in Geomorphology.”
- **Undergraduate Advisory Board, Panelist**, Spring 2020, advise department undergraduate majors on applying to graduate school.
- **American Geophysical Union Fall Meeting, Session Co-Convener**, 9-13 Dec 2019, “Centennial Session: Leopoldian, Bagnoldian, and Einsteinian Geomorphology Today: Historical Reflections and New Approaches”.
- **Hayden Fellowship Seminar, Discussion host**, 7 Aug 2019, on helping dept. summer scholarship undergraduates apply for graduate school.
- **Penn Prep Summer School ‘Climate Change on the Blue Planet’, Instructor**, 7 Jul-2 Aug 2019, 2x 2-week course I devised and taught for rising-freshman students mostly on scholarships.
- **Penn Prep Summer School ‘Climate Change on the Blue Planet’, Instructor**, 24 Jul-3 Aug 2018, 2-week course I devised and taught for rising-freshman students mostly on scholarships.
- **Philadelphia Science Festival, Presenter**, 21-28 Apr 2017, flume river evolution at the Franklin Institute.
- **Titjimat Teachabout Inc., Science Program Coordinator**, Aug 2013-Feb 2014, devised and implemented a 4-week STEM program for indigenous Australian high school students. I also attracted government, private and university funding for this NGO.
- **River Nile Learning Centre, ESL and Science Tutor**, Feb 2012-Nov 2012, pro-bono tutoring for 10 South Sudanese refugees in Melbourne ranging across mature-aged vocational courses, undergraduate written English help, high school sciences.

## Workshops (\*denotes scheduled)

- ‘A new classification of aeolian landforms’, Nov 8-13 2021, Invited participant in conference to define bedform taxonomic framework.
- **InSightSeers Program**, Jun 28-Jul 2 2021, NASA InSight Science Team Meeting observer for exposure to Mars mission work.
- **Unlearning Racism in Geosciences (URGE)**, Jan 2021-May 2021, NSF-funded discipline-wide workshop, department ‘pod’ member.
- **Inclusive & Equitable Teaching Workshop**, Feb 26-Apr 1 2020, U. Penn 5-week course committed to diversity-promoting education.
- **From point clouds and full-waveform data to DEM analysis**, Sept 30-Oct 4 2019, U. Potsdam week on elevation models.
- **Mid-Atlantic Soft Matter Workshop**, 12 Aug 2019, regional conference at Johns Hopkins University.
- **Thinkful City Coho, Git & Github: your coding safety net**, 12 Feb 2019, course on collaborating through Github.
- **Penn Institute for Computational Science, Data Analysis in Python**, 8-9 Apr 2017, data packages i.e. Pandas.
- **Woods Hole Oceanographic Institute, OCB Workshop**, 25-28 Jul 2016, current and future topics in the OCB community.
- **Monash University, ARCCSS Tropical Meteorology Winter School**, 20-24 Jun 2016, course on tropical weather and climate systems.
- **CLIVAR/JAMSTEC, 2<sup>nd</sup> Session of OMDP: Forcing Ocean-Ice Climate Models**, 14-15 Jan 2016, live stream to session.
- **University of New South Wales, ARCCSS Scientific Writing Workshop**, 17-19 Nov 2015, journal publishing course.
- **University of Queensland, AMOS Software Carpentry Workshop**, 13-15 Jul 2015, Python and Git course.
- **University of Tasmania, DaSH Software Carpentry Workshop**, Jun 2015-Jul 2015, Unix, SQL and R weekly sessions.
- **University of Tasmania, ARCCSS Biogeochemistry Winter School**, 15-19 Jun 2015, course on global nutrient cycle, etc.

## Standardised Tests

- **Graduate Record Examinations (GRE)**, Aug 2015, Verbal: 163 (92<sup>nd</sup>%), Quantitative: 163 (86<sup>th</sup>%), Analytical: 5.0 (93<sup>rd</sup>%).
- **Australian Tertiary Admissions Rank (ATAR)**, 2011, 99<sup>th</sup>% of Australians applying for undergraduate study in 2011.
- **Various Olympiads**, 2011, Higher Distinctions in Australasian Mathematics, Informatics, Computer Science, Economics Olympiads.

## Leadership Responsibilities

- **Student Representative, UPenn EES Faculty Meetings**, 2019-2020, represent PhD students to the department faculty.
- **Executive Board Member, Graduate Assembly UPenn**, Aug 2017-Aug 2018, 1 of 6 students elected to represent ~2000 graduate students, maintain a budget of over US\$125K.
- **Department Representative, Graduate Assembly UPenn**, Aug 2016- Aug 2017, represent my department to the wider university.
- **Executive Student Committee, Trinity College**, Oct 2013-Oct 2014, 1 of 8 elected students to represent 350 residential students, oversee a AU\$300k annual budget, organise all social or pastoral activities, and manage an associated incorporated company.

- **Director, Trinity Leadership Challenge**, *Nov 2012-Oct 2013*, led a leadership program in which 8 students raised AU\$20k, participated in professional development seminars, served charities and hiked an important Australian war trail in Papua New Guinea.
- **Editor, Trinity College Students' Publication**, *Feb 2013-Nov 2013*, sole editor of student-led quarterly university publication.