

# Joseph Steer

## Aerospace Engineer

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### Joseph Steer

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### Skills

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Fortran, Python, C, C++, MATLAB, Git

Solidworks, Data Analysis, LaTeX, Multi-Physics Fluid Simulation

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### Education

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#### University of Oxford / DPhil in Engineering Science

OCTOBER 2020 - OCTOBER 2024

During my DPhil I developed a numerical tool that solved for the flow state at the outlet of a type of hypersonic wind tunnel known as an expansion tube. This was the central subject of my thesis, which was entitled: *Simulation of Expanding and Non-Equilibrium Hypersonic Flows*

#### University of Adelaide / Bachelor of Mechanical & Aerospace Engineering (Honours)

FEBRUARY 2015 - NOVEMBER 2019, ADELAIDE

I graduated in November of 2019 with first class honours and a grade point average of 6.90/7 in the top 1% of my cohort.

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### Professional Experience

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#### University of Oxford / Research Assistant in Hypersonic Test Facilities

JANUARY 2020 - PRESENT, OXFORD

In this role I was an operator of the Oxford High Density Tunnel (HDT) and the T6 Stalker Tunnel. I carry out start up and shut down operations and fill and fire the tunnels over a range of different test conditions. I design and carry out experiments that utilize a wide variety of instrumentation including schlieren optics and high-speed cameras, infrared thermography, spectroscopy, high-powered lasers, pressure sensitive paint, high-speed pressure transducers, heat flux gauges, and others.

#### Santos Ltd / Engineer

NOVEMBER 2018 - FEBRUARY 2019, ADELAIDE

In this role I worked as part of the asset integrity team. The focus of my work was a review of passive fireproofing on large LPG storage vessels at the Pt. Bonython processing facility. In this role I require a high level of attention to detail and knowledge of local and international engineering standards, quality writing skills, all findings are documented in the form of engineering reports, presentation skills, I present periodically to my colleagues on my findings.

## **AssetOn Technologies / Project Engineer**

FEBRUARY 2017 - JANUARY 2018, ADELAIDE

In this role I worked with a small team to develop and market the Mining Toolbox software. Mining Toolbox is a benchmarking tool for heavy mining equipment and provides budget models, feasibility models and plant rates to clients. In this role I required high level professional communication and working knowledge of the MySQL Database software.

## **Big Iron Consulting / Support Engineer**

JUNE 2016 - FEBRUARY 2017, ADELAIDE

In this role I developed work instruction documents required for the maintenance of mining equipment. This involved transferring information from manufacturers manuals into an easy-to-use format for clients. In this role I required a high level of attention to detail and a high level of proficiency in Microsoft Word and Excel.

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## **Publications**

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### **Journal of Spacecraft and Rockets**

Steer, J., Collen, P., Glenn, A., Hambidge, C., Doherty, L., McGilvray, M., Loehle, S. and Walpot, L. 2024. Commissioning of upgrades to T6 to study giant planet entry.

### **AIAA SciTech 2024**

J Steer, J Clarke, M McGilvray, DM Luca. 2024. LASTA 2.0: Validation of a Reverse Time Integration Method

T.J. Crumpton, J. Steer, J Clarke, A.B. Glenn, P.L. Collen and M. McGilvray. 2024. Analysis of Mars Entry Shock Wave Radiation in the T6 Stalker Hypersonic Wind Tunnel

### **AIAA SciTech 2023**

Steer, J., Collen, P., Glenn, A., Hambidge, C., Doherty, L., McGilvray, M., Loehle, S. and Walpot, L., 2023. Shock radiation tests for Ice Giant entry probes including CH<sub>4</sub> in the T6 free-piston driven wind tunnel.

Steer, J., Collen, P., Glenn, A., Sopek, T., Hambidge, C., Doherty, L., McGilvray, M., Loehle, S. and Walpot, L., 2023. Experimental simulation of a Galileo sub-scale model at Ice Giant entry conditions in the T6 free-piston driven wind tunnel.

### **FAR Conference 2022**

McGilvray, M., Collen, P., Doherty, L., Steer, J., Leader, J., Glenn, A. and Hambidge, C., 2022. The Oxford T6 Stalker tunnel: performance, upgrades and new modes of operation.

### **ESA RHTG 2022**

Leader, J., Steer, J., Collen, P. and McGilvray, M., 2022. Measurement of aeroheating of satellite components at true flight total enthalpies.

Steer, J., Collen, P., Glenn, A., Hambidge, C., Doherty, L., McGilvray, M., Loehle, S. and Walpot, L., 2022. Shock radiation tests for Ice Giant entry probes including CH<sub>4</sub> in the T6 free-piston driven wind tunnel.

Steer, J., Collen, P., Glenn, A., Sopek, T., Hambidge, C., Doherty, L., McGilvray, M., Loehle, S. and Walpot, L., 2022. Experimental simulation of a Galileo sub-scale model at Ice Giant entry conditions in the T6 free-piston driven wind tunnel.

### **AIAA SciTech 2022**

Loehle, S., Meindl, A., Poloni, E., Steer, J., Sopek, T., McGilvray, M. and Walpot, L., 2022. Experimental Simulation of Gas Giant Entry in the PWK1 Arcjet Facility including CH<sub>4</sub>. In AIAA SCITECH 2022 Forum (p. 0264).

### **AFMC 2018**

Steer, J., Li, S.W., Morcom, N., Jucius, S., Ghanadi, F. and Arjomandi, M., 2018. Pedestrian-level wind conditions around buildings for wind comfort assessment.

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## **Teaching Experience**

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### **University of Oxford / Coursework Module Demonstrator**

MARCH 2021 - PRESENT, OXFORD

In this role I deliver the fluids coursework module which introduces 3rd year engineering students to the possibilities of a research career in engineering. I demonstrate the use of a reflected shock tube to groups of 15.

### **University of Oxford / B9 Tutor**

MARCH 2021 - PRESENT, OXFORD

In this role I served as a tutor on the B9 Structures & Hydraulics course. I organized and delivered lessons to third year undergraduate students as well as marked their work. I have also delivered the Fluids Coursework Module for the past 2 years

### **Lincoln College / Open Day Tutor**

MAY 2023

In this role I deliver the fluids coursework module which introduces 3rd year engineering students to the possibilities of a research career in engineering. I demonstrate the use of a reflected shock tube to groups of 15.

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## Awards

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### **University of Adelaide / Dean's Award for Academic Excellence**

Awarded for achieving high distinctions in all final year engineering subjects.

### **University of Adelaide / Sir Ross & Sir Keith Smith Scholarship**

\$1,500 (AUD) cash prize for aerospace engineering students. Selection is made according to academic merit. Academic merit for continuing students is determined according to students' cumulative Grade Point Average (GPA) or equivalent scores.

### **VSSEC / NASA I2 Internship Program**

I was accepted into this program and awarded \$13,000 (AUD) in funding to attend in 2020, however I was unable to participate due to COVID-19 travel restrictions.

### **SACE / Chemistry Certificate of Merit**

Awarded for a perfect score in Year 12 chemistry.