

Emeritus Prof. Damon Honnery  
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## Biography

Damon Honnery is an Emeritus Professor in the Department of Mechanical and Aerospace Engineering. He obtained his undergraduate degree in mechanical engineering from the University of Sydney in 1985. Following this he was employed as a research fellow at the University of Sydney during which he obtained a MEngSc in 1987. In 1987 he was awarded a cadet research scientist position in the Aeronautical Research Laboratory (ARL) during which he obtained his PhD in gas turbine related research from the University of Sydney in 1992. This was followed by an appointment as a research scientist at ARL in the Propulsion Branch where he undertook research on soot formation in gas turbines systems. In 1993 he took up a lectureship at Monash University at the Caulfield Campus, he then moved to the Clayton Campus in 1999 where he established the Monash Aerospace Engineering Degree and with Julio Soria he jointly established the Laboratory for Turbulence Research in Aerospace and Combustion being co-director until 2023. In the Department of Mechanical and Aerospace Engineering where he lectured in propulsion systems he has been Aerospace Course Director, Director of Undergraduate Affairs, Director of Research, and Deputy Head. In the Faculty of Engineering he held the position of Deputy Dean Operations, played a leading role in the development of the Monash Makerspace and was Interim Joint Director of the Woodside-Monash Energy Partnership. His research interests range from spray systems, particle flows, pollutant formation, renewable energy and climate change mitigation. As well as his fundamental research across these topics he has also carried out applied research across a range of industries including aerospace, automotive, rail, freight, energy, mining and pharmaceuticals.

## Qualifications

### Research output

#### **Volatile propellant droplet evaporation measurements in metered dose inhaler sprays**

Duke, D. J., Scott, H. N., Kusangaya, A. J., Kastengren, A., Ilavsky, J., Sforzo, B., Myatt, B., Cocks, P., Stein, S., Young, P. & Honnery, D., 10 Nov 2023, In: *Aerosol Science and Technology*. 57, 12, p. 1280-1293 14 p.

#### **The largest diameter of falling drop in the up-gas flow**

Zhao, H., Nguyen, D., Edgington-Mitchell, D., Soria, J., Liu, H. F. & Honnery, D., Feb 2023, In: *International Journal of Multiphase Flow*. 159, 6 p., 104345.

#### **Deep reductions in energy use: Hobson's choice in climate's last-chance saloon**

Honnery, D. & Moriarty, P., 22 Dec 2022, In: *Energies*. 16, 1, 4 p., 122.

#### **Solution-based pressurized metered dose inhaler formulations using HFA134a, HFA152a and HFO1234ze(E) propellants: Analysis of size, aerosolization performance and particle morphology**

Marasini, N., Koala, V., Rao, L., Duke, D. J., Honnery, D., Stein, S., Myatt, B., Cocks, P., Ong, H. X. & Young, P., 9 Dec 2022, *Proceedings of Drug Delivery to the Lungs Conference 2022*. Vol. 33. p. 167-170 4 p.

#### **Making energy green – a method for quantifying the ecosystem maintenance energy and the green energy return on energy invested**

Daaboul, J., Moriarty, P., Palmer, G. & Honnery, D., 10 Apr 2022, In: *Journal of Cleaner Production*. 344, 9 p., 131037.

#### **Porous medium applications in internal combustion engines: a review**

Aboujafari, M., Valipour, M. S., Hajjalimohammadi, A. & Honnery, D., Feb 2022, In: *Transport in Porous Media*. 141, 3, p. 799-824 26 p.

#### **In-vitro evaluation of pMDI spray development of HFA134a, HFA152a and HFO1234ze(E)**

Rao, L., Kusangaya, A. J., Marasini, N., Ong, H. X., Myatt, B., Cocks, P., Honnery, D., Young, P. & Duke, D. J., 2022, *Proceedings of Drug Delivery to the Lungs Conference 2022*. Vol. 33. p. 179-182 4 p.

### **Saturated vapor pressure of HFA152a-ethanol and HFO1234ze(E)-ethanol binary mixtures**

Vutlapalli, S., Rao, L., Myatt, B., Cocks, P., Young, P., Honnery, D. & Duke, D. J., 2022, *Proceedings of Drug Delivery to the Lungs Conference 2022*. Vol. 33. p. 171-174 4 p.

### **Life-cycle greenhouse gas emissions and net energy assessment of large-scale hydrogen production via electrolysis and solar PV**

Palmer, G., Roberts, A., Hoadley, A., Dargaville, R. & Honnery, D., 19 Aug 2021, In: *Energy & Environmental Science*. 14, 10, p. 5113-5131 19 p.

### **Combining modelling with advanced experimental techniques to optimize formulation and nozzle design for low GWP pMDIs**

Duke, D. J., Nguyen, D., Scott, H., Kusangaya, A.J., Kastengren, A. L., Schmidt, D. & Honnery, D., 4 May 2021, *Proceedings of Respiratory Drug Delivery 2021*. Virginia Commonwealth University

### **Using the Plateau-Rayleigh Instability to Produce HFA152a Droplets**

Scott, H., Nguyen, D., Honnery, D. & Duke, D. J., 4 May 2021, *Proceedings of Respiratory Drug Delivery 2021*. Virginia Commonwealth University

### **The risk of catastrophic climate change: Future energy implications**

Moriarty, P. & Honnery, D., Apr 2021, In: *Futures*. 128, 102728.

### **Increasing the fine particle fraction of pressurised metered dose inhaler solutions with novel actuator shapes**

Duke, D. J., Nguyen, D. T., dos Reis, L. G., Silva, D. M., Neild, A., Edgington-Mitchell, D., Young, P. M. & Honnery, D. R., 15 Mar 2021, In: *International Journal of Pharmaceutics*. 597, 10 p., 120341.

### **The limits of renewable energy**

Moriarty, P. & Honnery, D., 2021, In: *AIMS Energy*. 9, 4, p. 812-829 18 p.

### **The generation of screech tones by shock leakage**

Edgington-Mitchell, D., Weightman, J., Lock, S., Kirby, R., Nair, V., Soria, J. & Honnery, D., 15 Dec 2020, In: *Journal of Fluid Mechanics*. 908, 33 p., 908A46.

### **Feasibility of a 100% global renewable energy system**

Moriarty, P. & Honnery, D., 22 Oct 2020, In: *Energies*. 13, 21, 5543.

### **Influence of pressure transducer protrusion depth on pressure measurements of shock waves in shock tubes**

Thethy, B., Kaebe, B., Honnery, D., Edgington-Mitchell, D. & Kleine, H., Oct 2020, In: *Review of Scientific Instruments*. 91, 10, 3 p., 106101.

### **Acoustic pMDI Patient Guidance Device: Impact on Drug Delivery**

Sanders, M., Duke, D. J. & Honnery, D., 2020, *Respiratory Drug Delivery 2020*. Vol. 2. 7 p.

### **Evaluation of shock dividers using numerical and experimental methods**

Haghdoost, M. R., Thethy, B. S., Nadolski, M., Klein, R., Honnery, D., Edgington-Mitchell, D., Seo, B., Paschereit, C. O. & Oberleithner, K., 2020, *AIAA Scitech 2020 Forum*. American Institute of Aeronautics and Astronautics, 19 p. (AIAA Scitech 2020 Forum; vol. 1 PartF).

### **Multimodal X-ray and laser diagnostics for pressurized metered dose inhaler sprays**

Duke, D. J., Mason-Smith, N., Kastengren, A. L., Ilavsky, J., Young, P., Traini, D., Lewis, D., Edgington-Mitchell, D. & Honnery, D., 2020, *ICLASS 2018 - 14th International Conference on Liquid Atomization and Spray Systems*.

### **Redistribution of transient shock waves using shock dividers**

Thethy, B. S., Haghdoost, M. R., Paschereit, C. O., Honnery, D., Edgington-Mitchell, D. & Oberleithner, K., 2020, *AIAA Scitech 2020 Forum*. American Institute of Aeronautics and Astronautics, 16 p. (AIAA Scitech 2020 Forum; vol. 1 PartF).

**Understanding flow rate influence on clip-tone guided inhaler delivery**

Sanders, M., Johnson, R., Young, P., Duke, D. J., Honnery, D. & Tran, C., 2020, p. A20-A21. 2 p.

**X-ray and optical assessment of alternative propellant p-152A in pMDI sprays**

Duke, D. J., Sforzo, B. A., Kastengren, A. L., Young, P. M. & Honnery, D., 2020, p. A8-A8. 1 p.

**Effect of turbulence on drop breakup in counter air flow**

Zhao, H., Nguyen, D., Duke, D. J., Edgington-Mitchell, D., Soria, J., Liu, H. F. & Honnery, D., 1 Nov 2019, In: International Journal of Multiphase Flow. 120, 10 p., 103108.

**The influence of cylindrical spray chamber geometry on the evolution of high pressure diesel sprays**

Nguyen, D. & Honnery, D., 1 Oct 2019, In: Journal of Fluids Engineering. 141, 10, 11 p., 101102.

**Energy efficiency or conservation for mitigating climate change?**

Moriarty, P. & Honnery, D., 16 Sept 2019, In: Energies. 12, 18, 17 p., 3543.

**Thermodynamic modeling and validation of in-cylinder flow in diesel engines**

Neshat, E., Nazemian, M. & Honnery, D., Sept 2019, In: Environmental Progress and Sustainable Energy. 38, 5, 12 p.

**Ecosystem maintenance energy and the need for a green EROI**

Moriarty, P. & Honnery, D., 1 Aug 2019, In: Energy Policy. 131, p. 229-234 6 p.

**Drug distribution transients in solution and suspension-based pressurised metered dose inhaler sprays**

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**Advanced numerical analyses on thermal, chemical and dilution effects of water addition on diesel engine performance and emissions utilizing artificial inert species**

Neshat, E., Bajestani, A. V. & Honnery, D., 15 Apr 2019, In: Fuel. 242, p. 596-606 11 p.

**Impact of coherence decay on wavepacket models for broadband shock-associated noise in supersonic jets**

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**Nozzle external geometry as a boundary condition for the azimuthal mode selection in an impinging underexpanded jet**

Weightman, J. L., Amili, O., Honnery, D., Edgington-Mitchell, D. & Soria, J., 10 Mar 2019, In: Journal of Fluid Mechanics. 862, p. 421-448 28 p.

**Equivalent shock-associated noise source reconstruction of screeching underexpanded unheated round jets**

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**Correlation analysis of high-resolution particle image velocimetry data of screeching jets**

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**Bioenergy with carbon capture and storage in a future world**

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**Energy Accounting for a Renewable Energy Future**

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**Global renewable energy resources and use in 2050**

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**New Energy Technologies: Microalgae, Photolysis and Airborne Wind Turbines**

Moriarty, P. & Honnery, D., 2019, In: *Sci*. 1, 43, 10 p.

**Plateau-Rayleigh breakup of supercooled refrigerant droplets**

Scott, H., Nguyen, D., Duke, D. J. & Honnery, D., 2019, *Proceedings of 9th Australian Conference on Laser Diagnostics*.

**Prospects for hydrogen as a transport fuel**

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**Signatures of shear-layer unsteadiness in proper orthogonal decomposition**

Weightman, J. L., Amili, O., Honnery, D., Soria, J. & Edgington-Mitchell, D., 1 Dec 2018, In: *Experiments in Fluids*. 59, 12, 180.

**Upstream-travelling acoustic jet modes as a closure mechanism for screech**

Edgington-Mitchell, D., Jaunet, V., Jordan, P., Towne, A., Soria, J. & Honnery, D., 25 Nov 2018, In: *Journal of Fluid Mechanics*. 855, 12 p., R1.

**An experimental investigation of coupled underexpanded supersonic twin-jets**

Bell, G., Soria, J., Honnery, D. & Edgington-Mitchell, D., 1 Sept 2018, In: *Experiments in Fluids*. 59, 9, 19 p., 139.

**Coupling modes of an underexpanded twin axisymmetric jet**

Knast, T., Bell, G., Wong, M., Leb, C. M., Soria, J., Honnery, D. R. & Edgington-Mitchell, D., 1 Sept 2018, In: *AIAA Journal*. 56, 9, p. 3524-3535 12 p.

**Dynamic stall in vertical axis wind turbines: Scaling and topological considerations**

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**Energy policy and economics under climate change**

Moriarty, P. & Honnery, D., 1 Jan 2018, In: *AIMS Energy*. 6, 2, p. 272-290 19 p.

**Kinematic wavepacket model for broadband shock associated noise in underexpanded supersonic jets**

Wong, M. H., Honnery, D., Edgington-Mitchell, D., Savarese, A. & Jordan, P., 1 Jan 2018, *2018 AIAA/CEAS Aeroacoustics Conference*. American Institute of Aeronautics and Astronautics, AIAA 2018-3465

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Edgington-Mitchell, D. M., Weightman, J. L., Soria, J. & Honnery, D. R., 1 Jan 2018, *2018 AIAA/CEAS Aeroacoustics Conference*. American Institute of Aeronautics and Astronautics, AIAA 2018-3147

**Chamber geometry effect on non-evaporating diesel spray evolution**

Nguyen, D. & Honnery, D., 2018, *Proceedings of the 21st Australasian Fluid Mechanics Conference, AFMC 2018*. Lau, T. C. W. & Kelso, R. M. (eds.). Australasian Fluid Mechanics Society

**Creating environmentally sustainable cities: Not an easy task**

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**Synchrotron x-ray measurements of pMDI sprays: enabling improved nozzle design**

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**The effect of jet exit pressure ratio on a jet in cross flow**

Knast, T., Mears, L., Arora, N., Guha, T. K., Kumar, R., Alvi, F. S., Honnery, D. R. & Edgington-Mitchell, D. M., 2018, *2018 Fluid Dynamics Conference*. American Institute of Aeronautics and Astronautics, AIAA 2018-3546

**Three futures: Nightmare, diversion, vision**

Moriarty, P. & Honnery, D., 2018, In: *World Futures*. 74, 2, p. 51-67 17 p.

**State of charge estimation for battery packs using H-infinity observer in underground mine electric vehicles**

He, F., Shen, W., Kapoor, A., Honnery, D. & Dayawansa, D., 2 Oct 2017, In: *Australian Journal of Electrical and Electronics Engineering*. 14, 3-4, p. 49-58 10 p.

**Spray flow structure from twin-hole diesel injector nozzles**

Nguyen, D., Duke, D., Kastengren, A. L., Matusik, K., Swantek, A. B., Powell, C. F. & Honnery, D., 1 Sept 2017, In: *Experimental Thermal and Fluid Science*. 86, p. 235-247 13 p.

**Stability and three-dimensional evolution of a transitional dynamic stall vortex**

Buchner, A.-J., Honnery, D. & Soria, J., 25 Jul 2017, In: *Journal of Fluid Mechanics*. 823, p. 166-197 32 p.

**Multi-zone model for diesel engine simulation based on chemical kinetics mechanism**

Neshat, E., Honnery, D. & Saray, R. K., 5 Jul 2017, In: *Applied Thermal Engineering*. 121, p. 351-360 10 p.

**Revealing pMDI Spray Initial Conditions: Flashing, Atomisation and the Effect of Ethanol**

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**An explanation for the phase lag in supersonic jet impingement**

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**A study of the relationship between NOx and the ion current in a direct-injection diesel engine**

Rao, R. & Honnery, D., 1 Feb 2017, In: *Combustion and Flame*. 176, p. 309-317 9 p.

**Fuzzy parameter tuning sliding mode control for longitudinal motion of underground mining electric vehicles based on a single wheel model**

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**Review: Assessing the climate mitigation potential of biomass**

Moriarty, P. & Honnery, D., 1 Jan 2017, In: *AIMS Energy*. 5, 1, p. 20-38 19 p.

**Engine tail pipe particulate emissions and fault detection using an ion current sensor**

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#### **Improved predictions of broadband shock associated noise in supersonic jets**

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#### **On the effects of nozzle lip thickness on the azimuthal mode selection of a supersonic impinging flow**

Weightman, J. L., Amili, O., Honnery, D., Edgington-Mitchell, D. & Soria, J., 2017, *23rd AIAA/CEAS Aeroacoustics Conference: 5-9 June 2017, Denver, Colorado*. Melton, L. & Bil, C. (eds.). Reston, VA: American Institute of Aeronautics and Astronautics, 12 p.

#### **Particle image velocimetry analysis of the twin supersonic jet structure and standing-wave**

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#### **Ultra high speed investigation of gaseous jet injected by a single-hole injector and proposing of an analytical method for pressure loss prediction during transient injection**

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#### **H infinity observer based state of charge estimation for battery packs in electric vehicles**

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#### **Impingement tones and associated shock instabilities in supersonic plug nozzle flows**

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#### **Can renewable energy power the future?**

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#### **Insights into Spray Development from Metered-Dose Inhalers Through Quantitative X-ray Radiography**

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**Sliding mode control of longitudinal motions for underground mining electric vehicles with parametric uncertainties**

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#### **Uncertainty, utopia, and our contested future**

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## Projects

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Australian Research Council (ARC), Graphenex Pty Ltd, Great Wrap Pty Ltd

11/08/23 → 10/08/28

### **Characterising particulate laden flow in the lung airways: from drug delivery to primary anthropogenic sources**

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Australian Research Council (ARC), Monash University, University of Sydney

1/01/06 → 31/12/06

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Duke, D., Honnery, D., Young, P. M., Stein, S., Myatt, B. & Gavtash, B.

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Stewart, P., Honnery, D., Traini, D. & Young, P. J.

Australian Research Council (ARC)

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26/04/19 → 31/12/22

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