

PERSONAL INFORMATION

Full name: Dr. Woutijn Johannes Baars
 [ORCID iD](#) (0000-0003-1526-3048)  [Researcher ID](#) (f-6600-2016)  [Google Scholar](#)
 Contact:  w.j.baars@tudelft.nl  +31 6 2531 5031 (UTC +2:00)  baars-delft.tech
 Current position: Assistant Professor, Aerodynamics & Aeroacoustics
 Institute: Faculty of Aerospace Engineering
 Delft University of Technology
 Kluyverweg 1, 2629 HS Delft
 The Netherlands

RESEARCH INTERESTS

Aeroacoustics • turbulence • wall-bounded flows • drag reduction • experimental techniques in fluids & acoustics • atmospheric boundary layer flows • acoustic propagation effects • low-speed aerodynamics & design • full-scale testing • air-breathing/space propulsion • jet noise & active/passive noise reduction

EDUCATION

2009 – 2013 **PH.D.** in Aerospace Engineering and Eng. Mech., **THE UNIVERSITY OF TEXAS AT AUSTIN**, U.S.A.
Advisor: Dr. Charles E. Tinney
Dissertation: Acoustics from high-speed jets with crackle.
Committee: C. E. Tinney, N. T. Clemens, D. B. Goldstein, M. F. Hamilton, P. J. Morris
 2006 – 2009 **M.Sc.** with honors in Aerospace Engineering, **DELFT UNIVERSITY OF TECHNOLOGY**, Netherlands
Advisor: Dr. Fulvio Scarano
Thesis: Ice-induced aircraft stability upsets.
Committee: F. Scarano, L. L. M. Veldhuis, C. E. Tinney
 2003 – 2006 **B.Sc.** with honors in Aerospace Engineering, **DELFT UNIVERSITY OF TECHNOLOGY**, Netherlands

ACADEMIC AND INDUSTRY POSITIONS

2020 – present **ASSISTANT PROFESSOR – AEROSPACE ENGINEERING, DELFT UNIVERSITY OF TECHNOLOGY**, Netherlands
Group: • Aerodynamics and Aeroacoustics.
 2019 – 2020 **ASSISTANT PROFESSOR – MECHANICAL ENGINEERING, AARHUS UNIVERSITY**, Denmark
Group: • Experimental Fluids and Aeroacoustics.
 2019 – 2019 **LECTURER – AEROSPACE & AVIATION, SCHOOL OF ENGINEERING, RMIT UNIVERSITY**, Australia
Topics: • Aeroacoustics of high-speed jets.
 • Noise from drone rotors and low-noise propeller design.
 2013 – 2018 **RESEARCH FELLOW, MECHANICAL ENGINEERING, THE UNIVERSITY OF MELBOURNE**, Australia
Sponsor: Australian Research Council, PI: Dr. I. Marusic
Topics: • Wall-coherent spectral structure of velocity fluctuations in turbulent boundary layers.
 • Predictive models for statistics of high-Reynolds-number wall-turbulence.
 • Real-time active flow control of large-scale structures in high-Reynolds-number TBLs.
 2018 – 2018 **VISITING RESEARCHER, NATIONAL CENTER FOR PHYSICAL ACOUSTICS, UNIVERSITY OF MISSISSIPPI**, U.S.A.
Sponsor: Office of Naval Research - NAVAIR, PI: Dr. N.E. Murray
Topics: • Invited participant in R&D work: aero-acoustic measurements of jet noise, development, and quantification of supersonic jet noise reduction technology.
 2009 – 2013 **RESEARCH ASSISTANT, THE UNIVERSITY OF TEXAS AT AUSTIN**, U.S.A.
Sponsors: Air Force Office of Scientific Research, PI: Dr. C.E. Tinney
 NASA Space Shuttle Main Engine Project, PIs: J.H. Ruf & Dr. C.E. Tinney
Topics: • Shock wave boundary layer interactions in overexpanded axisymmetric nozzles.
 • Aero-acoustic aspects of heated and unheated jets (nonlinear distortion).

- 2008 – 2008 **RESEARCH ASSISTANT, IMPERIAL COLLEGE LONDON, U.K.**
Sponsor: Dr. S.E. Sherwin
Topic: • Numerical methods for vascular modeling, mesh generation from CT data.
- 2007 – 2007 **ENGINEER INTERN, LOCKHEED MARTIN AERONAUTICS, U.S.A.**
Teams: • F-35 Lightning II, liaison engineering (3 months) and material review board (3 months).

RESEARCH FUNDS SECURED

- 2022 **“AVIATION IN TRANSITION” GOVERNMENT NATIONAL GROWTH FUND, The Hague, Netherlands**
Title: AeroTherm – Aero-thermal management for future hydrogen/electric aircraft
Amount: \$1,000,000. PI share: \$250,000.
- 2022 **AFOSR-EUROPEAN OFFICE OF AEROSPACE RESEARCH & DEVELOPMENT, London office, U.K.**
Title: A-SURF – Acoustically-resonating surfaces for boundary layer flow control.
Amount: \$265,000 as PI.
- 2021 **DIN UNIVERSITY OF BOLOGNA VISITING FELLOWSHIP, University of Bologna, Forli, Italy**
Title: Experiments of wall-pressure in high-Reynolds-number pipe flow
Amount: \$4,000 as PI.
- 2019 **AUSTRALIAN DEFENCE, SCIENCE & TECHNOLOGY SBIRD STAGE 1, XROTOR PTY LTD, Australia**
Title: Model and test a UAV propeller prototype designed for noise-reduction.
Amount: \$64,000. Co-PI share: \$40,000, acoustic testing and physical analysis.
- 2018 **VISITING RESEARCHER FUNDS, THE UNIVERSITY OF MISSISSIPPI, U.S.A.**
Title: Passive nozzle-based jet noise reduction technology. Amount: \$7,500.
- 2015 – 2016 **EARLY CAREER RESEARCHER GRANT, THE UNIVERSITY OF MELBOURNE, Australia**
Title: Direct drag measurements of perturbed wall-bounded flows. Amount: \$10,000.

AWARDS

- Feb. 2011/12 **PROFESSIONAL DEVELOPMENT AWARD, THE UNIVERSITY OF TEXAS AT AUSTIN, U.S.A.**
For research on supersonic jet aeroacoustics and shock wave boundary layer interactions.
- Jan. 2010 **DAVID BRUTON, JR. GRADUATE SCHOOL FELLOWSHIP, THE UNIVERSITY OF TEXAS AT AUSTIN, U.S.A.**
Research work: side load unsteadiness of overexpanded rocket nozzles.
- Jun. 2006 **1ST PRIZE, DESIGN SYNTHESIS EXERCISE SYMPOSIUM, DELFT UNIVERSITY OF TECHNOLOGY, Netherlands**
Selected from among two hundred B.Sc. degree recipients.

TEACHING AND LECTURING

CERTIFICATION

Aug. 2021 **UTQ – UNIVERSITY TEACHING QUALIFICATION**

DELFT UNIVERSITY OF TECHNOLOGY, Netherlands

- Q2, 2020/21/22 AE2130-III, Aerodynamics II, Compressible Flows (B.Sc. level), responsible lecturer
Q1, Q2 2020/21/22 AE2111-I, Systems Design project, responsible lecturer
Q2 2020 UAM Profed course: societal and community impact of urban-air-mobility
Q4 2021 Design Synthesis Exercise, Tutor: Monitoring drone system for air quality, noise, and turbulence in the urban environment.

AARHUS UNIVERSITY, Denmark

Sem 2, 2019 Fluid Mechanics & Turbulence (M.Sc. level), co-lecturer

RMIT UNIVERSITY, Australia

- Sem 1, 2019 AERO2579 (undergraduate), Principles of Aerodynamics, co-lecturer
Sem 1, 2019 AERO2484 (online, undergraduate), Introduction to Aircraft, lecturer

THE UNIVERSITY OF MELBOURNE, Australia

- Spring 2017 ENGR20004 (undergraduate), Engineering Mechanics – Dynamics, lecturer
Fall 2016 ENGR20004 (undergraduate), Engineering Mechanics – Statics & Dynamics, substitute lecturer

THE UNIVERSITY OF TEXAS AT AUSTIN, U.S.A.

2009 – 2013 ASE120K (undergraduate), Aerodynamics Laboratory, teaching assistant, 4 semesters
2009 – 2011 ASE320 (undergraduate), Low-speed Aerodynamics, substitute lecturer, 2 semesters
Spring 2011 ASE364 (undergraduate), Applied Aerodynamics and Design, substitute lecturer
Fall 2010 ASE346 (graduate), Viscous Fluid Flow, substitute lecturer

RESEARCH MENTORING

DELFT UNIVERSITY OF TECHNOLOGY, Netherlands (supervision of PhD candidates)

2021 – present PhD: A. Hassanein (100% supervision) • Passive surfaces for flow control
2021 – present PhD: G. Dacome (100% supervision) • Real-time control of TBL flows
2020 – present PhD: H. Dekker (100% supervision) • Aeroacoustics of over the wing propulsion
2020 – present Over 8 MSc students under full supervision (not individually listed)

AARHUS UNIVERSITY, Denmark

2019 – 2020 MSc: M. Pedersen (100% supervision) • Data-driven wave packet model for jet noise exposure.

THE UNIVERSITY OF MELBOURNE, Australia

2017 – present PhD: X. Li (33% supervision) • Coherence of turbulence in the atmospheric surf-layer.
2017 – 2019 PhD: Z. Ruan (33% supervision) • Real-time control of large-scale motions in TBLs.
2013 – 2017 PhD: M. R. Abbassi (50% supervision) • Control of large-scale motions in TBLs.
2013 – 2019 Point of contact for 10+ PhD students in Melbourne's Fluid Mechanics Research Group.

THE UNIVERSITY OF TEXAS AT AUSTIN, U.S.A.

2009 – 2013 6+ undergraduate students: Design, construction, and support for high-speed flow research.

ACADEMIC AND COMMUNITY SERVICE

PEER REVIEW JOURNALS

95 articles covering fluid mechanics, aeroacoustics & acoustics:

- Journal of Fluid Mechanics (JFM)
- American Inst. of Aero. and Astro. (AIAA J.)
- Physics of Fluids (PoF)
- J. Acoustical Society of America (JASA)
- Int. Journal of Aeroacoustics (IJAA)
- Fluid Dynamics Research (FDR)
- MDPI Entropy
- J. Geophysical Research (JGR) – atmospheres
- Experiments in Fluids (EiF)
- Physical Review Fluids (PRF)
- Shock Waves
- Int. J. Heat and Fluid Flow (IJHFF)
- Flow Turbulence and Combustion (FTC)
- CEAS Aeronautical Journal
- J. American Helicopter Soc. (JAHS)
- MDPI Sensors

FUNDING PROPOSALS

- Australian Research Council (ARC), 2015
- Czech Science Foundation (GACR), 2020

COMMITTEES

- Vertical Flight Society – technical committee: acoustics
- MSc Aero & Wind Energy track application committee
- Organizing committee JMBC Burgers Symposium June 2022
- Aerospace Innovation Hub Start-up voucher judge (3 rounds a year)
- Board of Studies / Educational Board (Delft University)

OUTREACH

- Explore UT open house, tours of ASE/EM, The University of Texas at Austin, Mar. 2010 & 2011
- UTeach Outreach Summer program 8th graders, The University of Texas at Austin, Jun. 2010
- Melbourne Laboratory tours, 9th International Symposium on Turb. and Shear Flow (TSFP9).

EXTRACURRICULAR ACTIVITIES

PRIVATE PILOT FAA - Private Pilot License (VFR) – flying general-aviation aircraft.
Up-to-date Class II medical certificate.

TRAVEL, SPORTS: Europe, Africa, Australia, Americas • Mountain-biking, cycling, kayaking, running, team racing.

MEMBERSHIPS

- 2008 – present *Senior Member*, American Institute of Aeronautics and Astronautics (AIAA).
2020 – present *Member*, Vertical Flight Society – Division of Fluid Dynamics (APS).
2008 – present *Member*, American Physical Society – Division of Fluid Dynamics (APS).
2012 – present *Member*, Acoustical Society of America (ASA).
2020 – present *Member*, J.M. Burgerscentrum (JMBC).