

JUAN J. ALONSO

Juan J. Alonso is an associate professor in the Department of Aeronautics & Astronautics at Stanford University. He joined the faculty in 1997 shortly after receiving a PhD degree in Mechanical and Aerospace Engineering from Princeton University. He is the founder and director of the Aerospace Design Laboratory (ADL) where he specializes in the development of high-fidelity computational design methodologies to enable the creation of realizable and efficient aerospace systems. Prof. Alonso's research involves a large number of different applications including transonic, supersonic, and hypersonic aircraft, helicopters, turbomachinery, and launch and re-entry vehicles. He is the author of over 100 technical publications on the topics of computational design, multi-disciplinary optimization, fundamental numerical methods, and high-performance parallel computing. During the period spanning August 2006-October 2008, Prof. Alonso was the Director of the NASA Fundamental Aeronautics Program in Washington, DC. In that position he was responsible for the entire portfolio of aerospace vehicle and vehicle technology research for the agency in the subsonic rotary wing, subsonic fixed wing, supersonic, and hypersonic regimes, with particular emphasis on the energy efficiency and sufficiency of the aviation enterprise and its environmental impact. As Director of the Fundamental Aeronautics Program, he also oversaw a large number of interactions with academia, industry, and other government agencies including the FAA, the Department of Defense (USAF, Army, Navy), Department of Energy, DARPA, and the JPDO. He is also the recipient of several awards and fellowships including being a three-consecutive-time recipient of the AIAA Best Paper Award in MDO, the NASA 2009 Exceptional Public Service Medal, the Stanford Chapter AIAA Professor of the Year Award, the Ray Grimm Memorial Prize in Computational Physics, and the Terman and Princeton University Honorific fellowships. Prof. Alonso is deeply interested in the development of an advanced curriculum for the training of future engineers and scientists and has participated actively in the curriculum committee for the Institute for Computational and Mathematical Engineering (ICME) at Stanford University. He holds a Bachelor of Science in Aeronautics & Astronautics from the Massachusetts Institute of Technology (MIT 1991) where he was a member of the team that currently holds the world speed record for human powered vehicles over water. Prof. Alonso serves in the AIAA Multidisciplinary Optimization Technical Committee, the CGNS Steering Committee and the Center for Turbulence Research Steering Committee and he is a reviewer for a number of archival journals. He has also served in the NASA Advisory Council (Aeronautics Committee), the VAATE Steering Committee, the Fixed Wing Vehicle Executive Council, and the FAA Office of Environment & Energy REDAC. In the past, his research work has been funded by DARPA, AFOSR, the Department of Energy, NASA, Boeing, and Raytheon Aircraft among others.

Education:

- B.S. in Aeronautics & Astronautics, Massachusetts Institute of Technology, 1991.
- M.A. in Mechanical & Aerospace Engineering, Princeton University, 1993.
- Ph.D. in Mechanical & Aerospace Engineering, Princeton University, 1997.

Professional Experience:

- Stanford University, Associate Professor of Aeronautics & Astronautics (2004-present).
- NASA Headquarters, Director, Fundamental Aeronautics Program (2006-2008).
- Stanford University, Assistant Professor of Aeronautics & Astronautics (1998-2004).
- McDonnell Douglas Corporation, Aerodynamic Designer (1996-1998).
- Research Assistant, Princeton University (1991-1997).

Selected Relevant Publications

Choi, S., Potsdam, M., Lee, K., Iaccarino, G., and Alonso, J. J., "Helicopter Rotor Design Using a Time-Spectral and Adjoint-Based Method," AIAA Paper 2008-5810, 12th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Victoria, British Columbia, September, 2008.

Mader, C., Martins, J., Alonso, J. J., and van der Weide, E., "ADjoint: An Approach for the Rapid Development of Discrete Adjoint Solvers," AIAA Journal, vol. 46, no. 4, pp. 863-873, April 2008.

Choi, S., Alonso, J. J., Kroo, I. M., and Wintzer, M., "Multifidelity Design Optimization of Low-Boom Supersonic Jets," AIAA Journal, vol. 45, no. 1, pp. 106-118, January-February 2008.

Colonno, M., Reddy, S., and Alonso, J. J., "Multi-Fidelity Trajectory Optimization with Response Surface Based Aerodynamic Performance Prediction," AIAA Paper 2008-0218, 46th Aerospace Sciences Meeting & Exhibit, Reno, Nevada, January 2008.

Gopinath, A., van der Weide, E., Alonso, J. J., Jameson, A., Ekici, V., and Hall, K., "Three-Dimensional Unsteady Multi-Stage Turbomachinery Simulations Using the Harmonic Balance Technique," AIAA Paper 2007-0892, 45th Aerospace Sciences Meeting & Exhibit, Reno, Nevada, January 2007.

Alonso, J. J., Hahn, S., Ham, F., Herrmann, M., Iaccarino, G. and van der Weide, E., "CHIMPS: A High- Performance Scalable Module for Multi-Physics Simulations," AIAA Paper 2006-5274, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, Sacramento, CA, July 2006.

Marta, A. C., Alonso, J. J., Discrete Adjoint Formulation for the Ideal MHD Equations, 3rd AIAA Flow Control Conference, AIAA Paper 2006-3345, San Francisco, CA, June 2006.

van der Weide, E., Kalitzin, G., Schluter, J., Alonso, J.J., Unsteady Turbomachinery Computations Using Massively Parallel Platforms, 44th AIAA Aerospace Sciences Meeting and Exhibit, AIAA Paper 2006-0421, Reno, NV, January 2006.

Martins, J.R.R.A., Sturdza, P., Alonso, J.J., "The Complex-Step Derivative Approximation," ACM Transactions on Mathematical Software, Vol. 29, No. 3, September 2003, pp. 245-262.

Martins, J.R.R.A., Alonso, J.J, Reuther, J.J., "High-Fidelity Aero-Structural Design Optimization of a Supersonic Business Jet," AIAA Journal of Aircraft, July 2003.

Martins, J.R.R.A., Alonso, J.J, Reuther, J.J., "A Coupled-Adjoint Sensitivity Analysis Method for High-Fidelity Aero-Structural Design," Journal of Optimization and Engineering, 2003.

Doi, H., Alonso, J. J., "Fluid/Structure Coupled Aeroelastic Computations for Transonic Flows in -Turbomachinery," ASME Turbo Expo 2002, ASME GT-2002-30313, Amsterdam, The Netherlands, June 3-6, 2002.

Yao, J., Davis, R. L., Alonso, J. J., and Jameson, A., Massively Parallel Simulation of the Unsteady Flow in an Axial Turbine Stage, AIAA Journal of Propulsion and Power, Vol 18, No.2 pp 465-471, March-April, 2002.

Alonso, J.J., Kroo, I.M., and Jameson, A., Advanced Algorithms for Design and Optimization of Quiet Supersonic Platform, 40th AIAA Aerospace Sciences Meeting & Exhibit, AIAA Paper 2002-0144, Reno, NV, January 2002.

Reuther, J.J., Alonso, J.J., Jameson, A., Rimlinger, M.J., Saunders, D., "Constrained Multipoint Aerodynamic Shape Optimization Using an Adjoint Formulation and Parallel Computers: Parts I and II," AIAA Journal of Aircraft, vol. 36, no. 1, pp. 51-74, January-February 1999.

Reuther, J.J., Alonso, J.J., Rimlinger, M.J., Jameson, A., "Aerodynamic Shape Optimization of Supersonic Aircraft Configurations via an Adjoint Formulation on Distributed Memory Parallel Computers", Journal of Computers and Fluids, Vol. 28, 1999, pp. 675-700.

Pierce, N.A., Alonso, J.J., "Efficient Computation of Unsteady Viscous Flows by an Implicit Preconditioned Multigrid Method," AIAA Journal, vol. 36, no. 3, pp. 401-408, March 1998.