

# Michael J Belisle

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## Research interests

Aircraft drag reduction using laminar flow control  
Computations and experiments on boundary-layer stability and transition to turbulence  
Flight and wind tunnel test design, execution, and analysis

## Education

PhD in Aerospace Engineering · Texas A&M University · May 2012 (anticipated)  
Dissertation · *Integration of boundary-layer stability in the design of laminar-flow wing gloves*  
Advisor · WS Saric

MS in Aerospace Engineering · Arizona State University · Dec 2007  
Thesis · *Experiments on mode competition in temporally-modulated Taylor–Couette flow*  
Advisors · WS Saric and JM Lopez

BSE in Aerospace Engineering · Arizona State University · Dec 2005  
Thesis · *Temporal behavior of modulated Taylor–Couette flow*  
Advisor · WS Saric

## Research and teaching experience

Texas A&M University, College Station, Texas · Aug 2007–present

*Graduate Assistant Research* · Flight Research Laboratory, Aerospace Engineering  
Supervisor · WS Saric

Designed and analyzed boundary-layer stability of a wing glove for in-flight demonstration of laminar-flow on a Gulfstream III aircraft; contributed to the development of a laminar flow health monitoring system concept; expanded data acquisition system for aircraft dynamic maneuver measurements in a flight testing course; supported flight-test experiments; administered computational workstations.

Arizona State University, Tempe, Arizona · May 2003–Aug 2007

*Graduate Research Assistant* · Mathematics and Statistics · May–Aug 2007  
Supervisor · JM Lopez

Conducted Taylor–Couette experiments in support of MS thesis, including writing instrument control, data acquisition, quantitative image analysis programs.

*Graduate Teaching Assistant* · Mechanical and Aerospace Engineering · Sept 2006–May 2007  
Supervisor · KD Squires

Administered laboratory experiments in senior-level mechanical engineering course.

*Undergraduate Research Assistant* · Mathematics and Statistics · Oct–Dec 2005  
Supervisor · JM Lopez

Resurrected large-scale Taylor–Couette experimental apparatus and conducted preliminary experiments in support of undergraduate thesis.

*Undergraduate Research Assistant* · Wind Tunnel Complex, Mech. and Aerospace Engineering · May 2003–May 2005  
Supervisor · WS Saric

Supported wind tunnel experiments, including hot-wire/hot-film anemometry and infrared thermography; created and maintained group website.

von Karman Institute, Rhode-Saint-Genèse, Belgium · May–Aug 2005

*Stagiaire*, Aeronautics and Aerospace

Supervisor · H Deconinck

Validated THOR CFD code using airfoil pressure measurements from a transonic wind tunnel test.

### Publications

Belisle MJ, Roberts MW, Tufts MW, Tucker AA, Williams TC, Saric WS, and Reed HL. 2011. Design of the Subsonic Aircraft Roughness Glove Experiment (SARGE). Invited, AIAA paper 2011-3524.

Belisle MJ, Neale TP, Reed HL, and Saric WS. 2010. Design of a swept-wing laminar flow control flight experiment for transonic aircraft. AIAA paper 2010-4381.

Mavris DN, Saric WS, Ran H, Belisle MJ, Woodruff MJ, and Reed HL. 2010. Investigation of a health-monitoring methodology for future natural laminar flow transport aircraft. Invited, *27th International Congress of the Aeronautical Sciences*. ICAS paper 2010-1.9.3.

Avila M, Belisle MJ, Lopez JM, Marques F, and Saric WS. 2008. Mode competition in modulated Taylor–Couette flow. *J. Fluid Mech.* 601:381–406.

### Presentations

Belisle MJ, Saric WS, Avila M, Lopez JM, and Marques F. 2009. Mode competition in experimental modulated Taylor–Couette flow. *16th International Couette–Taylor Workshop*, Princeton University.

Avila M, Belisle MJ, Lopez JM, Marques F, and Saric WS. 2007. Mode competition in modulated Taylor–Couette flow. *APS 60th Annual Meeting of the Division of Fluid Dynamics*, Salt Lake City, Utah.

Belisle MJ, Saric WS, Lopez JM, and Avila M. 2007. Mode competition between reversing and nonreversing modulated Taylor–vortex flow. *15th International Couette–Taylor Workshop*, Université du Havre, France.

Belisle MJ. 2007. Temporal behavior of Taylor–Couette flow sinusoidally modulated about a zero mean. *2007 AIAA Region VI Student Conference*, San Jose State University. Second place in Master's division.

Belisle MJ. 2005. Description and verification of the reconstructed Arizona State University Taylor–Vortex Generator. *2005 AIAA Region VI Student Conference*, California Polytechnic State University.

### Professional activities and leadership

Aircraft Owners and Pilots Association · *Member* · 2010–present

American Institute of Aeronautics and Astronautics · *Student Member* · 2003–present  
*Graduate Student Representative* · Texas A&M University Student Branch · 2009–2010

*Council Member* · Phoenix Section · 2004–2005

*Chair* · Arizona State University Student Branch · 2004–2005

American Physical Society · *Student Member* · 2007–present

American Society of Mechanical Engineers · *Student Member* · 2002–present  
*Webmaster* · Arizona State University Student Section · 2002–2004

Ira A. Fulton School of Engineering Student Council (Arizona State University)

*Newsletter Coordinator* · 2004–2005

*Director of Communications* · 2003–2004

National Association of Engineering Student Councils

*Vice-President, Communications* · West Region · 2004–2005

*Vice-President, Relations* · West Region · 2004

Society of Women Engineers · *Student Member* · 2003–present

*Student Council Representative* · Arizona State University Student Section · 2004–2005

*Webmaster* · Arizona State University Student Section · 2003–2004

### Grants and fellowships

2005 NSF Research Experience for Undergraduates

2004–2005 Fulton Undergraduate Research Initiative Grant

2001–2002 National Merit Scholarship

### Technical skills and experience

Computational and theoretical methods · Multidisciplinary design of laminar-flow airfoils for natural laminar flow (NLF) and passive laminar flow control (LFC) using spanwise-periodic discrete roughness elements (DRE); analysis of laminar–turbulent transition in boundary layers using linear stability theory (LST), linear and nonlinear parabolized stability equations (LPSE, NPSE); finite-difference solutions of partial differential equations; iterative and constrained optimization design methods; meanflow and direct-boundary-layer (DBL) solutions; analysis code scripting and input/output interfacing

Experimental methods · Experimental data acquisition and processing, including hotwire/hotfilm anemometry, pressure measurements, infrared thermography; flight test and wind tunnel test design of experiments (DOE); image processing, spectral analysis, and other data reduction techniques

Flight and wind tunnel test experience · Participated in wind tunnel tests at NASA Ames 11-Foot Transonic Unitary Plan Wind Tunnel, NASA Langley 4-Foot Supersonic Unitary Plan Wind Tunnel, and Illinois Institute of Technology National Diagnostic Facility; flight tests on Cessna O-2A aircraft at Texas A&M Flight Research Laboratory

Programming and other languages · Fortran 77/90/95, C, C++, Mathematica, MATLAB, LabVIEW, Python, Bourne shell scripting, awk, sed, XHTML, CSS, PHP, MySQL

CFD and boundary-layer analysis codes · LSTRAC, WINGBL2, FLUENT, GAMBIT, Q3BL, LST3D, TRANAIR++, XFOIL, Tecplot

Operating systems · System administration and utilization of various operating systems including Mac OS X, Linux (Ubuntu, Debian), IRIX, AIX, and Microsoft Windows

Other software · Microsoft Word, Powerpoint, Excel; Apple Keynote; Adobe Photoshop, Illustrator, Acrobat; SolidWorks; LaTeX