

Tim Colonius

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California Institute of Technology
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Education

STANFORD UNIVERSITY

PhD, Mechanical Engineering, June 1994.

STANFORD UNIVERSITY

MS, Mechanical Engineering, June 1988.

THE UNIVERSITY OF MICHIGAN

BSE(ME), Mechanical Engineering, *Summa Cum Laude* May 1987.

Principal Employment

CALIFORNIA INSTITUTE OF TECHNOLOGY

Department of Mechanical and Civil Engineering.

2017-now Frank and Ora Lee Marble Professor of Mechanical Engineering

2005-2017 Professor of Mechanical Engineering.

2000-2005 Associate Professor of Mechanical Engineering.

1994-2000 Assistant Professor of Mechanical Engineering.

Additional Appointments

Department of Medical Engineering, California Institute of Technology (2014 - now).

Option Representative, Medical Engineering, Caltech (2017-now).

Visiting Professor, University of Melbourne, Australia (2016).

Undergraduate Option Representative, Mechanical Engineering, Caltech (2010-2015).

Visiting Professor, University of Poitiers, France (2010).

Option Representative, Mechanical Engineering, Caltech (2001-2003, 2008).

Visiting Fellow, University of Cambridge, UK (2003).

Member of Technical Staff, FMC Corporate Technology Center, Santa Clara, CA (1994).

Graduate Research Assistant, Stanford University (1988-1994).

Research Interests

FLUID DYNAMICS: turbulence, aeroacoustics, flow/acoustic instability, cavitation, multiphase flow, shock waves.

NUMERICAL METHODS: high-order-accurate methods, boundary conditions, immersed-boundary methods, shock- and interface-capturing schemes.

CONTROL: active and passive flow control, reduced-order modeling, data assimilation.

BIOMEDICAL: shockwave and ultrasound therapy, lithotripsy.

Awards

Aeroacoustics Award, American Institute of Aeronautics and Astronautics (2018)
Fellow, Acoustical Society of America (2016).
Midwest Mechanics Invited Speaker (2012-2013).
Fellow, American Physical Society (2010).
Associate Fellow, American Institute of Aeronautics and Astronautics (2009).
AIAA Best Paper Award, 32nd AIAA Fluid Dynamics Conference (2003).
IUTAM Bureau Prize (2000).
NSF Career Award (1994-1999).
Powell Foundation Award (1997).

Teaching Experience

Mechanics (undergraduate, designed course).
Thermal Science (undergraduate, designed course).
Fluid Mechanics (undergraduate).
Fluid Mechanics (graduate).
Computational Fluid Mechanics (graduate).
Flow Control (graduate, designed course).
Acoustic Waves in Fluids (graduate, designed course).
Signal Processing, Coherent Structures, and Reduced-Order Modeling in Turbulence (graduate, designed course).
Heat Transfer (undergraduate).
Heat Transfer (graduate).
Design and analysis of control systems (undergraduate, co-instructor).

Professional Activities and Service

PRINCIPAL/CO-INVESTIGATOR: Airbus, Aeroacoustics Research Consortium, AFOSR, Bosch Energy Research Network, Boeing, DARPA, JPL, Gordon and Betty Moore Foundation, NASA, NAVAIR, NIH, NSF, ONR.
THEORETICAL AND COMPUTATIONAL FLUID DYNAMICS: Editor-in-chief (2014-now); Handling editor (2003-2013).
AMERICAN PHYSICAL SOCIETY, DIVISION OF FLUID DYNAMICS: Executive committee (2009-2012); Organizing committee, 63rd Annual DFD Meeting (2010).
INTERNATIONAL SYMPOSIUM ON CAVITATION: Member of scientific committee, (2006-now).
INSTITUTE OF CAVITATION RESEARCH (ICR) ADVISORY COMMITTEE: Member (2013-2014).
WIMRC CAVITATION FORUM: Member of scientific committee, (2011-now).
CALIFORNIA INSTITUTE OF TECHNOLOGY FACULTY COMMITTEES: Academic Policies Committee, Graduate Study Committee, Conduct Review Committee, Committee on Patents & Relations with Industry (Chair), Undergraduate Admissions.
CONSULTANT: United Technologies Research Center, Jet Propulsion Laboratory, AeroHydroPLUS, Applaud Medical, confidential clients.
AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS: Discussion group on modal decompositions (2015-2016); Working group on flow control algorithms and architectures (2002-2004); Aeroacoustics Technical Committee (1996-2001); Technical co-chair, 4th AIAA / CEAS Aeroacoustics Conference (1998).

SYMPOSIUM ON GLOBAL FLOW INSTABILITY AND CONTROL: Co chair, 1st-6th symposia (2001-2015).

PAPER REVIEWER: *J. Fluid Mech.*, *Phys. Fluids*, *Phys. Rev. Fluids*, *J. Comput. Phys.*, *AIAA J.*, *J. Sound Vibration*, *JASA*, *Int. J. Aeroacoustics.*, *Theoret. Comput. Fluid Dyn.*, *Europ. J. Mechanics B - fluids*, *SIAM J. Appl. Math.*, *SIAM J. Sci. Comput.*, *Exp. Fluids*, *J. Fluids Engrg.*, *Fluid Dyn. Resrch.*, *Int. J. Multiphase Flow*, *Comput. Meth. Appl. Mech. Engrg.*, *Biomech. Model. Mechanobiology.*, *Comput. Fluids*, *Turbo Expo*, *Ultrasound Medicine Bio.*, *Int. J. Comput. Fluid Dyn.*, *Int. J. Numeric. Meth. Fluids.*, *Aerosp. Sci. Tech.*, *Appl. Math. Model.*, *Appl. Num. Math.*, *Int. J. Heat Fluid Flow*, *J. Fluids Struct.*, *Proc. Roy Soc. A.*

Patents

Stewart Sherrit *et al.* Flow energy piezoelectric bimorph nozzle harvester. US Patent 9,531,303 B2, issued Dec 27, 2016.

Invited Presentations and Lectures (boldface indicates keynote/plenary address)

University of California, AMES, San Diego, CA (1996).

University of Tokyo, Mech. Engrg., Tokyo, Japan (1996).

Caltech, Mech. Engrg. (1996).

Northrop Grumman Corp. Pico Rivera, CA (1996).

von Karman Institute for Fluid Dynamics, Lecture Series 1997-07, Sint-Genesius-Rode, Belgium (1997).

Caltech, GALCIT Fluid Mechanics Sem., Pasadena, CA (1998).

University of Arizona, Mech. and Aerosp. Engrg., Tuscon, AZ (1999).

University of California, Los Angeles, Los Angeles, CA (1999).

BERLIN99 Meeting of the Acoustical Society of America, Berlin. (1999).

University of California, AMES. San Diego, CA (1999).

3rd ASME/JSME Joint Fluids Engineering Conference, San Francisco, CA (1999).

ICTAM 2000. Chicago, IL (2000).

United Technologies Research Center, East Hartford, CT (2000).

Cargese Summer School in Physics—Sound-Flow Interaction Lecture Series. Cargese, Corsica, France (2000).

Stanford University, Fluid Mechanics, Stanford, CA (2000).

Caltech, GALCIT Fluid Mechanics Sem., Pasadena, CA (2000).

39th AIAA Aerospace Sciences Meeting, Reno NV (2001).

RWTH Aachen. Aachen, Aerodynamisches Institute, Aachen, Germany (2001).

Aerospace Corporation, El Segundo, CA (2001).

von Karman Institute for Fluid Dynamics, Lecture Series 2001-02, Sint-Genesius-Rode, Belgium (2001).

Conference on Decision and Control, Las Vegas, NV (2002).

Harvey Mudd College, Engrg. & Applied Sci. Pomona, CA (2002).

University of Minnesota, Aerosp. Engrg., Minneapolis, MN (2002).

141st Meeting of Acoustical Society of America, Chicago, IL (2003).

146th Meeting of the Acoustical Society of America, Austin, TX (2003).

University of Cambridge, DAMPT, Cambridge, UK (2003).
 University of Cambridge, Engineering., Cambridge, UK (2003).
 Florida State University, Dept. of Math., Tallahassee, FL (2003).
 University of Twente, Enschede, The Netherlands (2003).
 Rolls Royce, Derby, UK (2003).
 United Technologies Research Center, East Hartford, CT (2003).
 34th AIAA Fluid Dynamics Conference, Portland, OR (2004).
 Boeing Commercial Aircraft, Renton, WA (2004).
 NASA Langley Research Center, Hampton, VA (2004).
 University of Illinois at Urbana-Champaign, TAM. 2004.
 KTH (Royal Institute of Technology), Stockholm, Sweden (2005).
9th CEAS-ASC Workshop, Stockholm, Sweden (2005).
 Massachusetts Institute of Technology, Mechanical Engrg., Cambridge, MA (2005).
 Florida State University, Applied Mathematics, Tallahassee, FL (2006).
 AIAA 3rd Flow Control Conference, San Francisco, CA (2006).
 University of California, Santa Barbara, Mech. Engrg. Santa Barbara, CA (2006).
 von Karman Institute for Fluid Dynamics, Lecture Series 2006-05, Sint-Genesius-Rode, Belgium (2005).
 World Congress on Computational Mechanics, Los Angeles, CA (2006).
 Princeton University MAE Dept., Princeton, NJ (2007).
 University of Rome "La Sapienza", Rome, Italy (2007).
 Universidad Politecnica de Madrid, Madrid, Spain (2007).
 SAIC Corporation, San Diego, CA (2007).
 University of Southern California, Aerospace and Mechanical Engineering, Los Angeles, CA (2007).
 AIAA 38th Fluid Dynamics Conference, Seattle WA (2008).
 AIAA 39th Fluid Dynamics Conference, Orlando, FL (2009).
 Florida State University, Mechanical Engineering, Tallahassee, FL (2009).
 Stanford University, Fluid Mechanics Seminar, Stanford, CA (2009).
 University of Illinois, Urbana-Champaign, Fluid Mechanics Seminar, Urbana, IL (2009).
 Universite Pierre et Marie Curie (Paris 6). Institut d'Alembert Seminar, Paris, France (2010).
 Ecole Polytechnique, LadHyX seminar, Palaiseau, France (2010).
 Technical University of Eindhoven, Dept. of Applied Physics Seminar, Eindhoven, The Netherlands (2010).
 University of Poitiers, C.E.A.T. seminar. Poitiers, France (2010). (3 seminars)
CFD 2010: 5th European Conf. on Comp. Fluid Dynamics. Lisbon, Portugal (2010).
 University of Melbourne, Australia, Fluid Mechanics Seminar, Melbourne, Australia (2011).
 University of California, San Diego, MAME seminar, San Diego, CA (2011).
 University of California, Santa Barbara, Mechanical Engineering, Santa Barbara, CA (2012).
 100th Anniversary of the Aerodynamics Institute, RWTH Aachen, Germany (2012).
 Midwest Mechanics Invited Speaker. Seminars at Illinois Institute of Technology, Iowa State University, Michigan State University, Notre Dame University, Purdue University, Northwestern University, University of Illinois, University of Michigan, University of Minnesota, University of Wisconsin. (2012-2013).
ERCOTAC Workshop, Direct and Large Eddy Simulation 9, Dresden, Germany (2013).

EUROMECH 547, Trends in Open Shear Flow Instability, Paris, France (2013).
 AIAA Fluid Dynamics Conference, Invited Speaker for Future of Fluids Session (2013).
 University of California, Santa Barbara, Mechanical Engrg., Santa Barbara, CA (2013).
 University of California, Irvine, Mechanical and Aerosp. Engrg., Irvine, CA (2014).
 University of Maryland, Aerosp. Engrg., College Park, MD (2014).
67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, CA (2014).
 AIAA SciTech 2015, Kissimmee, FL (2015).
 Boeing Research & Technology, Huntington Beach, CA, (2015).
 University of Twente, Mechanical Engineering, Enschede, The Netherlands (2015).
 University of Melbourne, Mech. Engrg., Melbourne, Australia (2016).
 ONR Workshop on Active Flow Control, Pax River, MD (2016).
 University of Washington, Mech. Engrg., Seattle, WA (2016).
 AIAA Aviation 2017, Washington, DC (2016).
24th Intl. Congress of Theoretical and Applied Mechanics, Montréal, Canada (2016).
10th ABCM Spring School on Transition and Turbulence, San Jose Dos Campos, Brazil (2016).
 University of California, Santa Barbara, Fluid Mechanics, Santa Barbara, CA (2016).
 Workshop on the status and future directions of Wall-Modeled Large Eddy Simulation (WM-LES) for aeronautical applications, University of Maryland (2016).
3rd International Conference on Numerical Methods in Multiphase Flows, Tokyo, Japan (2017).
47th AIAA Fluid Dynamics Conference, Denver, CO (2017).
 Massachusetts Institute of Technology, Mechanical Engineering (2017).
10th International Cavitation Symposium, Baltimore, MD (2018).
AIAA Aeroacoustics Award Lecture, AIAA Aviation 2018, Atlanta, GA (2018).

Journal Articles

- [J117] K. Maeda and T. Colonius, “Bubble cloud dynamics in an ultrasound field,” *ArXiv preprint arXiv:1805.00129*, 2018.
- [J116] J. C. Meng and T. Colonius, “Numerical simulation of the aerobreakup of a water droplet,” *Journal of Fluid Mechanics*, vol. 835, pp. 1108–1135, 2018. DOI: [10.1017/jfm.2017.804](https://doi.org/10.1017/jfm.2017.804).
- [J115] A. Towne, O. Schmidt, and T. Colonius, “Spectral proper orthogonal decomposition and its relationship to dynamic mode decomposition and resolvent analysis,” *Journal of Fluid Mechanics*, vol. 847, pp. 821–867, 2018. DOI: [10.1017/jfm.2018.283](https://doi.org/10.1017/jfm.2018.283).
- [J114] D. B. Araya, T. Colonius, and J. O. Dabiri, “Transition to bluff-body dynamics in the wake of vertical-axis wind turbines,” *Journal of Fluid Mechanics*, vol. 813, pp. 346–381, 2017. DOI: [10.1017/jfm.2016.862](https://doi.org/10.1017/jfm.2016.862).
- [J113] D. E. Breakey, P. Jordan, A. V. Cavalieri, P. A. Nogueira, O. Léon, T. Colonius, and D. Rodríguez, “Experimental study of turbulent-jet wave packets and their acoustic efficiency,” *Physical Review Fluids*, vol. 2, no. 12, p. 124601, 2017. DOI: [10.1103/physrevfluids.2.124601](https://doi.org/10.1103/physrevfluids.2.124601).

- [J112] A. Goza and T. Colonius, “A strongly-coupled immersed-boundary formulation for thin elastic structures,” *Journal of Computational Physics*, vol. 336, pp. 401–411, 2017. DOI: [10.1016/j.jcp.2017.02.027](https://doi.org/10.1016/j.jcp.2017.02.027).
- [J111] —, “Modal decomposition of fluid-structure interaction with application to flag flapping,” *ArXiv preprint arXiv:1711.03040*, 2017.
- [J110] A. Goza, T. Colonius, and J. E. Sader, “Global modes and nonlinear analysis of inverted-flag flapping,” *ArXiv preprint arXiv:1709.09745*, 2017.
- [J109] P. Jordan, V. Jaunet, A. Towne, A. V. Cavalieri, T. Colonius, O. Schmidt, and A. Agarwal, “Jet-edge interaction tones,” *ArXiv preprint arXiv:1710.07578*, 2017.
- [J108] S. Liska and T. Colonius, “A fast immersed boundary method for external incompressible viscous flows using lattice Green’s functions,” *Journal of Computational Physics*, vol. 331, pp. 257–279, 2017. DOI: [10.1016/j.jcp.2016.11.034](https://doi.org/10.1016/j.jcp.2016.11.034).
- [J107] K. Maeda and T. Colonius, “A source term approach for generation of one-way acoustic waves in the Euler and Navier–Stokes equations,” *Wave Motion*, vol. 75, pp. 36–49, 2017. DOI: [10.1016/j.wavemoti.2017.08.004](https://doi.org/10.1016/j.wavemoti.2017.08.004).
- [J106] —, “Eulerian-Lagrangian method for simulation of cloud cavitation,” *ArXiv preprint arXiv:1712.00670*, 2017.
- [J105] K. Sasaki, A. V. Cavalieri, P. Jordan, O. T. Schmidt, T. Colonius, and G. A. Brès, “High-frequency wavepackets in turbulent jets,” *Journal of Fluid Mechanics*, vol. 830, R2, 2017. DOI: [10.1017/jfm.2017.659](https://doi.org/10.1017/jfm.2017.659).
- [J104] O. T. Schmidt, A. Towne, T. Colonius, A. V. Cavalieri, P. Jordan, and G. A. Brès, “Wavepackets and trapped acoustic modes in a turbulent jet: Coherent structure eduction and global stability,” *Journal of Fluid Mechanics*, vol. 825, pp. 1153–1181, 2017. DOI: [10.1017/jfm.2017.407](https://doi.org/10.1017/jfm.2017.407).
- [J103] O. T. Schmidt, A. Towne, G. Rigas, T. Colonius, and G. A. Brès, “Spectral analysis of jet turbulence,” *ArXiv preprint arXiv:1711.06296*, 2017.
- [J102] A. Sharma, V. Theofilis, and T. Colonius, “Special issue on global flow instability and control,” *Theoretical and Computational Fluid Dynamics*, vol. 31, pp. 471–474, 2017. DOI: [10.1007/s00162-017-0444-y](https://doi.org/10.1007/s00162-017-0444-y).
- [J101] A. Sinha, A. Towne, T. Colonius, R. H. Schlinker, R. Reba, J. C. Simonich, and D. W. Shannon, “Active control of noise from hot supersonic jets,” *AIAA Journal*, 2017. DOI: [10.2514/6.2013-2234](https://doi.org/10.2514/6.2013-2234).
- [J100] K. Taira, S. L. Brunton, S. Dawson, C. W. Rowley, T. Colonius, B. J. McKeon, O. T. Schmidt, S. Gordeyev, V. Theofilis, and L. S. Ukeiley, “Modal analysis of fluid flows: An overview,” *AIAA Journal*, vol. 55, no. 12, pp. 4013–4031, 2017. DOI: [10.2514/1.j056060](https://doi.org/10.2514/1.j056060).
- [J99] A. Towne, A. V. Cavalieri, P. Jordan, T. Colonius, O. Schmidt, V. Jaunet, and G. A. Brès, “Acoustic resonance in the potential core of subsonic jets,” *Journal of Fluid Mechanics*, vol. 825, pp. 1113–1152, 2017. DOI: [10.2514/6.2016-2809](https://doi.org/10.2514/6.2016-2809).
- [J98] A. Goza, S. Liska, B. Morley, and T. Colonius, “Accurate computation of surface stresses and forces with immersed boundary methods,” *Journal of Computational Physics*, vol. 321, pp. 860–873, 2016. DOI: [10.1016/j.jcp.2016.06.014](https://doi.org/10.1016/j.jcp.2016.06.014).
- [J97] S. Liska and T. Colonius, “A fast lattice Green’s function method for solving viscous incompressible flows on unbounded domains,” *Journal of Computational Physics*, vol. 316, pp. 360–384, 2016. DOI: [10.1016/j.jcp.2016.04.023](https://doi.org/10.1016/j.jcp.2016.04.023).

- [J96] A. Sinha, K. Guðmundsson, H. Xia, and T. Colonius, “Parabolized stability analysis of jets from serrated nozzles,” *Journal of Fluid Mechanics*, vol. 789, pp. 36–63, 2016. DOI: [10.1017/jfm.2015.719](https://doi.org/10.1017/jfm.2015.719).
- [J95] H.-C. Tsai and T. Colonius, “Coriolis effect on dynamic stall in a vertical axis wind turbine,” *AIAA Journal*, vol. 54, no. 1, pp. 216–226, 2016. DOI: [10.2514/1.j054199](https://doi.org/10.2514/1.j054199).
- [J94] J. Choi, T. Colonius, and D. R. Williams, “Surging and plunging oscillations of an airfoil at low Reynolds number,” *Journal of Fluid Mechanics*, vol. 763, pp. 237–253, 2015. DOI: [10.1017/jfm.2014.674](https://doi.org/10.1017/jfm.2014.674).
- [J93] T. L. B. Flinois and T. Colonius, “Optimal control of circular cylinder wakes using long control horizons,” *Physics of Fluids*, vol. 27, no. 8, 2015. DOI: [10.1063/1.4928896](https://doi.org/10.1063/1.4928896).
- [J92] H. J. Lee, S. Sherrit, L. P. Tosi, P. Walkemeyer, and T. Colonius, “Piezoelectric energy harvesting in internal fluid flow,” *Sensors*, vol. 15, no. 10, pp. 26 039–26 062, 2015. DOI: [10.3390/s151026039](https://doi.org/10.3390/s151026039).
- [J91] K. Maeda, W. Kreider, A. Maxwell, B. Cunitz, T. Colonius, and M. Bailey, “Modeling and experimental analysis of acoustic cavitation bubbles for burst wave lithotripsy,” *J. Phys.: Conf. Ser.*, vol. 656, p. 012027, 2015. DOI: [10.1088/1742-6596/656/1/012027](https://doi.org/10.1088/1742-6596/656/1/012027).
- [J90] J. C. Meng and T. Colonius, “Numerical simulations of the early stages of high-speed droplet breakup,” *Shock Waves*, vol. 25, no. 4, pp. 399–414, 2015. DOI: [10.1007/s00193-014-0546-z](https://doi.org/10.1007/s00193-014-0546-z).
- [J89] D. Rodríguez, A. V. G. Cavalieri, T. Colonius, and P. Jordan, “A study of linear wavepacket models for subsonic turbulent jets using local eigenmode decomposition of piv data,” *European Journal of Mechanics B-Fluids*, vol. 49, pp. 308–321, 2015. DOI: [10.1016/j.euromechflu.2014.03.004](https://doi.org/10.1016/j.euromechflu.2014.03.004).
- [J88] A. Towne and T. Colonius, “One-way spatial integration of hyperbolic equations,” *Journal of Computational Physics*, vol. 300, pp. 844–861, 2015. DOI: [10.1016/j.jcp.2015.08.015](https://doi.org/10.1016/j.jcp.2015.08.015).
- [J87] A. Uzun, F. S. Alvi, T. Colonius, and M. Y. Hussaini, “Spatial stability analysis of subsonic jets modified for low-frequency noise reduction,” *AIAA Journal*, vol. 53, no. 8, pp. 2335–2358, 2015. DOI: [10.2514/1.J053719](https://doi.org/10.2514/1.J053719).
- [J86] V. Coralic and T. Colonius, “Finite-volume WENO scheme for viscous compressible multicomponent flows,” *Journal of Computational Physics*, vol. 274, pp. 95–121, 2014. DOI: [10.1016/j.jcp.2014.06.003](https://doi.org/10.1016/j.jcp.2014.06.003).
- [J85] D. Fuster, J. M. Conoir, and T. Colonius, “Effect of direct bubble-bubble interactions on linear-wave propagation in bubbly liquids,” *Physical Review E*, vol. 90, no. 6, 2014. DOI: [10.1103/PhysRevE.90.063010](https://doi.org/10.1103/PhysRevE.90.063010).
- [J84] S. Liska and T. Colonius, “A parallel fast multipole method for elliptic difference equations,” *Journal of Computational Physics*, vol. 278, pp. 76–91, 2014. DOI: [10.1016/j.jcp.2014.07.048](https://doi.org/10.1016/j.jcp.2014.07.048).
- [J83] J. D. Regele, J. Rabinovitch, T. Colonius, and G. Blanquart, “Unsteady effects in dense, high speed, particle laden flows,” *International Journal of Multiphase Flow*, vol. 61, pp. 1–13, 2014. DOI: [10.1016/j.ijmultiphaseflow.2013.12.007](https://doi.org/10.1016/j.ijmultiphaseflow.2013.12.007).
- [J82] A. Sinha, D. Rodríguez, G. A. Brès, and T. Colonius, “Wavepacket models for supersonic jet noise,” *Journal of Fluid Mechanics*, vol. 742, pp. 71–95, 2014. DOI: [10.1017/jfm.2013.660](https://doi.org/10.1017/jfm.2013.660).

- [J81] G. A. Brès, M. Inkman, T. Colonius, and A. V. Fedorov, “Second-mode attenuation and cancellation by porous coatings in a high-speed boundary layer,” *Journal of Fluid Mechanics*, vol. 726, pp. 312–337, 2013. DOI: [10.1017/jfm.2013.206](https://doi.org/10.1017/jfm.2013.206).
- [J80] A. V. G. Cavalieri, D. Rodríguez, P. Jordan, T. Colonius, and Y. Gervais, “Wavepackets in the velocity field of turbulent jets,” *Journal of Fluid Mechanics*, vol. 730, pp. 559–592, 2013. DOI: [10.1017/jfm.2013.346](https://doi.org/10.1017/jfm.2013.346).
- [J79] V. Coralic and T. Colonius, “Shock-induced collapse of a bubble inside a deformable vessel,” *European Journal of Mechanics B-Fluids*, vol. 40, pp. 64–74, 2013. DOI: [10.1016/j.euromechflu.2013.01.003](https://doi.org/10.1016/j.euromechflu.2013.01.003).
- [J78] Y. Feldman and T. Colonius, “On a transitional and turbulent natural convection in spherical shells,” *International Journal of Heat and Mass Transfer*, vol. 64, pp. 514–525, 2013. DOI: [10.1016/j.ijheatmasstransfer.2013.04.042](https://doi.org/10.1016/j.ijheatmasstransfer.2013.04.042).
- [J77] P. Jordan and T. Colonius, “Wave packets and turbulent jet noise,” *Annual Review of Fluid Mechanics*, vol. 45, pp. 173–195, 2013. DOI: [10.1146/annurev-fluid-011212-140756](https://doi.org/10.1146/annurev-fluid-011212-140756).
- [J76] S. Pirozzoli and T. Colonius, “Generalized characteristic relaxation boundary conditions for unsteady compressible flow simulations,” *Journal of Computational Physics*, vol. 248, pp. 109–126, 2013. DOI: [10.1016/j.jcp.2013.04.021](https://doi.org/10.1016/j.jcp.2013.04.021).
- [J75] D. Rodríguez, A. Sinha, G. A. Brès, and T. Colonius, “Inlet conditions for wave packet models in turbulent jets based on eigenmode decomposition of large eddy simulation data,” *Physics of Fluids*, vol. 25, no. 10, 2013. DOI: [10.1063/1.4824479](https://doi.org/10.1063/1.4824479).
- [J74] A. V. G. Cavalieri, P. Jordan, T. Colonius, and Y. Gervais, “Axisymmetric superdirectivity in subsonic jets,” *Journal of Fluid Mechanics*, vol. 704, pp. 388–420, 2012. DOI: [10.1017/jfm.2012.247](https://doi.org/10.1017/jfm.2012.247).
- [J73] Y. Feldman, T. Colonius, M. T. Pauken, J. L. Hall, and J. A. Jones, “Simulation and cryogenic experiments of natural convection for the Titan Montgolfiere,” *AIAA Journal*, vol. 50, no. 11, pp. 2483–2491, 2012. DOI: [10.2514/1.J051672](https://doi.org/10.2514/1.J051672).
- [J72] J. A. Franck and T. Colonius, “Effects of actuation frequency on flow control applied to a wall-mounted hump,” *AIAA Journal*, vol. 50, no. 7, pp. 1631–1634, 2012. DOI: [10.2514/1.J051183](https://doi.org/10.2514/1.J051183).
- [J71] X. B. Li, M. L. Hunt, and T. Colonius, “A contact model for normal immersed collisions between a particle and a wall,” *Journal of Fluid Mechanics*, vol. 691, pp. 123–145, 2012. DOI: [10.1017/jfm.2011.461](https://doi.org/10.1017/jfm.2011.461).
- [J70] T. Sanada, K. Ando, and T. Colonius, “Effects of target compliance on a high-speed droplet impact,” *Ultra Clean Processing of Semiconductor Surfaces X*, vol. 187, pp. 137–140, 2012. DOI: [10.4028/www.scientific.net/SSP.187.137](https://doi.org/10.4028/www.scientific.net/SSP.187.137).
- [J69] A. Sinha, H. Alkandry, M. Kearney-Fischer, M. Samimy, and T. Colonius, “The impulse response of a high-speed jet forced with localized arc filament plasma actuators,” *Physics of Fluids*, vol. 24, no. 12, 2012. DOI: [10.1063/1.4772191](https://doi.org/10.1063/1.4772191).
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- [Adv13] K. Guðmundsson, “Instability wave models of turbulent jets from round and serrated nozzles,” PhD thesis, California Institute of Technology, 2010.

- [Adv12] W. T. Joe, “Optimized feedback control of vortex shedding on an inclined flat plate,” PhD thesis, California Institute of Technology, 2010.
- [Adv11] J. Kimmel, “Numerical simulation of wave focusing and scattering in shock wave lithotripsy,” PhD thesis, California Institute of Technology, 2010.
- [Adv10] J. Franck, “Large-eddy simulation of flow separation and control on a wall-mounted hump,” PhD thesis, California Institute of Technology, 2009.
- [Adv9] E. Johnsen, “Numerical simulations of non-spherical bubble collapse with applications to shockwave lithotripsy,” PhD thesis, California Institute of Technology, 2008.
- [Adv8] K. Taira, “The immersed boundary projection method and its application to simulation and control of flows around low-aspect-ratio wings,” PhD thesis, California Institute of Technology, 2008.
- [Adv7] G. Brès, “Numerical simulations of three-dimensional instabilities in cavity flows,” PhD thesis, California Institute of Technology, 2007.
- [Adv6] H. Ran, “Numerical study of the dynamics and sound generation of a turbulent vortex ring,” PhD thesis, California Institute of Technology, 2005.
- [Adv5] A. Preston, “Modeling and computation of bubbly cavitating flow,” PhD thesis, California Institute of Technology, 2004.
- [Adv4] M. Tanguay, “Numerical simulation and analysis of shockwave lithotripsy,” PhD thesis, California Institute of Technology, 2004.
- [Adv3] J. Eldredge, “A dilating vortex particle method for compressible flow with application to aeroacoustics,” PhD thesis, California Institute of Technology, 2001.
- [Adv2] C. Rowley, “Modeling, simulation, and control of cavity flow oscillations,” PhD thesis, California Institute of Technology, 2001.
- [Adv1] K. Mohseni, “A: universality in vortex formation; B: evaluation of Mach wave radiation in a supersonic jet.,” PhD thesis, California Institute of Technology, 2000.

Doctoral students (member of committee)

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