

## Peer reviewed publications of Marc Avila

1. [A. Vela-Martín](#) and [M. Avila](#). Large-scale patterns set the predictability limit of extreme events in Kolmogorov flow. *J. Fluid Mech.*, 986:A2, 2024.
2. [A. Simonini](#), [M. Dreyer](#), [A. Urbano](#), [F. Sanfedino](#), [T. Himeno](#), [P. Behruzi](#), [M. Avila](#), [J. Pinho](#), [L. Peveroni](#) and [J.-B. Gouriet](#). Cryogenic propellant management in space: open challenges and perspectives. *Npj Microgravity* 10 (1):34, 2024.
3. [T. P. Ramalho](#), [V. Baumgartner](#), [N. Kunst](#), [D. Rodrigues](#), [E. Bohuon](#), [B. Leroy](#), [G. Pillot](#), [C. Heinicke](#), [S. Kerzenmacher](#), [M. Avila](#), [C. Verseux](#). Resource-efficiency of cyanobacterium production on Mars: Assessment and paths forward. *Algal Research* 84, 103801, 2024.
4. [D. Feldmann](#), [D. Borrero-Echeverry](#), [M.J. Burin](#), [K. Avila](#) and [M. Avila](#). Routes to turbulence in Taylor–Couette flow. *Philos. Trans. Royal Soc. A*, 38.2246:20220114, 2023.
5. [T. Schikarski](#), [H. Trzenschiok](#), [M. Avila](#) and [W. Peukert](#). Impact of solvent properties on the precipitation of active pharmaceutical ingredients. *Powder Technology.*, 415:118032, 2023.
6. [M. Avila](#), [D. Barkley](#) and [B. Hof](#). Transition to turbulence in pipe flow. *Annu. Rev. Fluid Mech.*, 55.1:575–602, 2023.
7. [A. Vela-Martín](#) and [M. Avila](#). Memoryless drop breakup in turbulence. *Sci. Adv.*, 8.50:eabp9561, 2022.
8. [D. Morón](#), [D. Feldmann](#) and [M. Avila](#). Effect of waveform on turbulence transition in pulsatile pipe flow *J. Fluid Mech.*, 948:A20, 2022.
9. [S.C. Endres](#), [M. Avila](#) and [L. Mädler](#). A discrete differential geometric formulation of multiphase surface interfaces for scalable multiphysics equilibrium simulations. *Chem. Eng. Sci.*, 257, 117681, 2022.
10. [H. Li](#), [A. Fischer](#), [M. Avila](#) and [D. Xu](#). Measurement error of tracer-based velocimetry in single-phase turbulent flows with inhomogeneous refractive indices. *Exp. Therm. Fluid Sci.*, 136:110681, 2022.
11. [T. Schikarski](#), [M. Avila](#), [H. Trzenschiok](#), [A. Güldenpfennig](#) and [W. Peukert](#). Quantitative modeling of precipitation processes. *Chem. Eng. J.*, 443:136195, 2022.
12. [F. Meyer](#), [C. Eigenbrod](#), [V. Wagner](#), [W. Paa](#), [J.C. Hermanson](#), [S. Ando](#) and [M. Avila](#). Oxygen droplet combustion in hydrogen under microgravity conditions. *Combustion and Flame*, 241, 112081, 2022.
13. [T. Schikarski](#), [M. Avila](#) and [W. Peukert](#). En route towards a comprehensive dimensionless representation of precipitation processes. *Chem. Eng. J.*, 428:131984, 2022.
14. [A. Vela-Martín](#) and [M. Avila](#). Deformation of drops by outer eddies in turbulence. *J. Fluid Mech.*, 929:A38, 2021.
15. [H. Li](#), [M. Avila](#) and [D. Xu](#). A single-camera synthetic Schlieren method for the measurement of free liquid surfaces. *Exp. Fluids*, 62:227, 2021.
16. [S. Gasow](#), [A. V. Kuznetsov](#), [M. Avila](#) and [Y. Jin](#). A macroscopic two-length-scale model for natural convection in porous media driven by a species-concentration gradient. *Journal of Fluid Mechanics*, 926, A8, 2021.
17. [C. Plana](#), [B. Song](#) and [M. Avila](#). Direct numerical simulation of two-phase pipe flow: influence of the domain length on the flow regime. *Int. J. Multiph. Flow*, 144:103786, 2021.

18. J. Tielke, M. Maas, M. Castillo, K. Rezwan and **M. Avila**. Statistical analysis of thermal conductivity experimentally measured in water-based nanofluids. *The Royal Society A*, 477, 2250, 2021
19. C. Verseux, C. Heinicke, T. P. Ramalho, J. Determann, M. Duckhorn, M. Smagin and **M. Avila**. A low-pressure, N<sub>2</sub>/CO<sub>2</sub> atmosphere is suitable for cyanobacterium-based life-support systems on Mars. *Front. Microbiol.*, 12:611798, 2021.
20. D. Feldmann, D. Morón and **M. Avila**. Spatiotemporal intermittency in pulsatile pipe flow. *Entropy*, 23:46, 2021.
21. D. Xu, B. Song and **M. Avila**. Non-modal transient growth of disturbances in pulsatile and oscillatory pipe flows. *J. Fluid Mech.*, 907:R5, 2021.
22. D. Xu, M. Heil, T. Seeböck and **M. Avila**. Resonances in pulsatile channel flow with an elastic wall. *Phys. Rev. Lett.*, 125:254501, 2020.
23. C. Heinicke, L. Orzechowski and **M. Avila**. The MaMBA-concept for an extraterrestrial base and its first module mock-up. *Acta Astronaut.*, 173:404–413, 2020.
24. D. Xu, A. Varshney, X. Ma, B. Song, M. Riedl, **M. Avila** and B. Hof. Nonlinear hydrodynamic instability and turbulence in pulsatile flow. *Proc. Natl. Acad. Sci. U.S.A.*, 117:11233–11239, 2020.
25. S. Gasow, Z. Lin, H.C. Zhang, A.V. Kuznetsov, **M. Avila** and Y. Jin. Effects of pore scale on the macroscopic properties of natural convection in porous media. *J. Fluid Mech.*, 891:A25, 2020.
26. J.M. Lopez, D. Feldman, M. Rampp, L. Shi and **M. Avila**. nsCouette – A high-performance code for direct numerical simulations of turbulent Taylor–Couette flow. *SoftwareX*, 11:100395, 2020.
27. T. Schikarski, H. Trzenschiok, **M. Avila** and W. Peukert. Influence of mixing on the precipitation of organic nanoparticles: A Lagrangian perspective on scale-up based on self-similar distributions. *Chem. Eng. & Technol.*, 42:1635–1642, 2019.
28. F. Wein, N. Chen, N. Iqbal, M. Stingl and **M. Avila**. Topology optimization of unsaturated flows in multi-material porous media: application to a simple diaper model. *Commun. Nonlinear Sci. Numer. Simul.*, 78:104871, 2019.
29. B. Song, J.M. Lopez, C. Plana and **M. Avila**. Phase-field simulation of core-annular pipe flow. *Int. J. Multiph. Flow*, 117:14–24, 2019.
30. T. Schikarski, H. Trzenschiok, W. Peukert and **M. Avila**. Inflow boundary conditions determine T-mixer efficiency. *React. Chem. Eng.*, 4:559–568, 2019.
31. D. Xu & **M. Avila**. The effect of pulsation frequency on transition in pulsatile pipe flow, *Journal of Fluid Mechanics*, 857:937-951, 2020.
32. J. Kühnen, B. Song, D. Scarselli, N. B. Budanur, A. P. Willis, **M. Avila** & B. Hof. Destabilizing turbulence in pipe flow, *Nature Physics*, 14:386-390, 2018.
33. D. Feldman and **M. Avila**. Overdamped large-eddy simulations of turbulent pipe flow up to Re=1500. *J. Phys.: Conf. Ser.*, 1001:012016, 2018.
34. G. Mamatsashvili, F. Stefani, A. Guseva & **M. Avila**. Quasi-two-dimensional nonlinear evolution of helical magnetorotational instability in a magnetized Taylor-Couette flow, *New Journal of Physics*, 20:013012, 2018.
35. P. Ritter, S. Zammert, B. Song, B. Eckhardt & **M. Avila**. Analysis and modeling of localized invariant solutions in pipe flow', *Phys. Rev. Fluids*, 3:013901, 2018.
36. A. Guseva, A. P. Willis, R. Hollerbach & **M. Avila**. Transport properties of the azimuthal magnetorotational instability', *The Astrophysical Journal*, 849, 2, 2017.
37. A. Guseva, A. P. Willis, R. Hollerbach & **M. Avila**. Dynamo action in a Quasi-Keplerian Taylor-Couette flow', *Physical Review Letters*, 119, 164501, 2017.

38. A. Guseva, R. Hollerbach, A. P. Willis & M. Avila. Azimuthal magnetorotational instability at low and high magnetic Prandtl numbers', *Magnetohydrodynamics*, 53, 25-34., 2017.
39. T. Schikarski, W. Peukert & M. Avila. Direct numerical simulation of water-ethanol flows in a T-mixer', *Chemical Engineering Journal*, 324, 168-181, 2017.
40. L. Shi, B. Hof, M. Rampp & M. Avila. Hydrodynamic turbulence in quasi-Keplerian rotating flows', *Physics of Fluids*, 29, 044107, 2017.
41. J. M. Lopez & M. Avila. Boundary-layer turbulence in experiments on quasi-Keplerian flows', *Journal of Fluid Mechanics*, 817, 21-34, 2017.
42. B. Song, D. Barkley, B. Hof & M. Avila. Speed and structure of turbulent fronts in pipe flow', *Journal of Fluid Mechanics*, 813, 1045-1059, 2017.
43. P. Ritter, F. Mellibovsky and M. Avila. Emergence of spatio-temporal dynamics from exact coherent solutions in pipe flow, *New Journal of Physics*, Volume 18, 08303, 2016.
44. G. Lemóult, L. Shi, K. Avila, S.V. Jalikop, M. Avila and B. Hof. Directed percolation phase transition to sustained turbulence in Couette flow. *Nature Physics*, 12:254–258, 2016.
45. D. Barkley, B. Song, V. Mukund, G. Lemoult, M. Avila, and B. Hof. The rise of fully turbulent flow. *Nature*, 526(7574):550–553, 2015.
46. A. Guseva, A. P. Willis, R. Hollerbach and M. Avila. Transition to magnetorotational turbulence in Taylor–Couette flow with imposed azimuthal magnetic field. *New Journal of Physics*, 17:093018, 2015.
47. J.M. Lopez, F. Marques and M. Avila. Conductive and convective heat transfer in fluid flows between differentially heated and rotating cylinders, *International Journal of Heat and Mass Transfer*, 90, 959–967, 2015.
48. L. Shi, M. Rampp, B. Hof and M. Avila. A Hybrid MPI-OpenMP Parallel Implementation for pseudospectral simulations with application to Taylor-Couette Flow, *Computer & Fluids*, 106:1-11, 2015.
49. S. Marezke, B. Hof and M. Avila. Transient growth in linearly stable Taylor–Couette flows. *Journal of Fluid Mechanics*, 742:254–290, 2014.
50. J.M. Lopez, F. Marques and M. Avila. The Boussinesq approximation in rapidly rotating flows, *Journal of Fluid Mechanics*, 737:56-77, 2013.
51. M. Avila and B. Hof. Nature of laminar-turbulence intermittency in shear flows, *Physical Review E* 87(6), 063012, 2013.
52. M. Avila, F. Mellibovsky, N. Roland and B. Hof. Streamwise-localized solutions at the onset of turbulence in pipe flow. *Physical Review Letters*, 110:224502, 2013.
53. L. Shi, M. Avila and B. Hof. Scale invariance at the onset of turbulence in Couette flow, *Physical Review Letters* 110(20), 204502, 2013.
54. M. Holzner, B. Song, M. Avila, B. Hof. Lagrangian approach to laminar–turbulent interfaces in transitional pipe flow, *Journal of Fluid Mechanics*, 723:140-162, 2013.
55. A. P. Willis, P. Cvitanovic and M. Avila. Revealing the state space of turbulent pipe flow by symmetry reduction. *Journal of Fluid Mechanics*, 721:514–540, 2013.
56. A. de Lozar, F. Mellibovsky, M. Avila and B. Hof. Edge state in pipe flow experiments, *Physical Review Letters* 108(21), 214502, 2012.
57. M. Avila. Stability and angular-momentum transport of fluid flows between corotating cylinders. *Physical Review Letters*, 108:124501, 2012.

58. [M. Holzner](#), [M. Avila](#), [A. de Lozar](#) and [B. Hof](#). A Lagrangian approach to the interface velocity of turbulent puffs in pipe flow. *J. Phys.: Conf. Ser.*, 318:052031, 2011.
59. [K. Avila](#), [D. Moxey](#), [A. de Lozar](#), [M. Avila](#), [D. Barkley](#) and [B. Hof](#). The onset of turbulence in pipe flow. *Science*, 333(6039):192–196, 2011.
60. [B. Hof](#), [A. de Lozar](#), [M. Avila](#), [X. Tu](#) and [T. M. Schneider](#). Eliminating turbulence in spatially intermittent flows. *Science*, 327(5972):1491–1494, 2010.
61. [M. Avila](#), [A. P. Willis](#) and [B. Hof](#). On the transient nature of localized pipe flow turbulence. *Journal of Fluid Mechanics*, 646:127–136, 2010.
62. [J.M. Lopez](#), [F. Marques](#), [A. Rubio](#) and [M. Avila](#). Crossflow instability of finite Bödewadt flows: transients and spiral waves, *Physics of Fluids* 21(11), 114107, 2009.
63. [A. Meseguer](#), [F. Mellibovsky](#), [M. Avila](#) and [F. Marques](#). Instability mechanisms and transition scenarios of spiral turbulence in Taylor-Couette flow, *Physical Review E* 80(4), 046315, 2009.
64. [A. Meseguer](#), [F. Mellibovsky](#), [M. Avila](#) and [F. Marques](#). Families of subcritical spirals in highly counter-rotating Taylor-Couette flow, *Physical Review E* 79(3), 036309, 2009.
65. [M. Avila](#), [M. Grimes](#), [J.M Lopez](#) & [F. Marques](#). Global endwall effects on centrifugally stable flows, *Physics of Fluids* 20(10), 104104, 2008.
66. [M. Avila](#), [M.J. Belisle](#), [J.M. Lopez](#), [F. Marques](#) and [W.S. Saric](#). Mode competition in modulated Taylor-Couette flow, *Journal of Fluid Mechanics* 601, 381-406, 2008.
67. [M. Avila](#), [F. Marques](#), [J.M. Lopez](#) and [A. Meseguer](#). Stability control and catastrophic transition in a forced Taylor-Couette system, *Journal of Fluid Mechanics* 590, 471-496, 2007.
68. [A. Meseguer](#), [M. Avila](#), [F. Mellibovsky](#) and [F. Marques](#). Solenoidal spectral formulations for the computation of secondary flows in cylindrical and annular geometries, *European Physics Journal: Special Topics* 146, 249-259, 2007.
69. [M. Avila](#), [A. Meseguer](#) and [F. Marques](#). Double Hopf bifurcation in co-rotating spiral Poiseuille flow, *Physics of Fluids* 18(6), 064101, 2006.