

# Manuel Torrilhon

## List of Publications by Year in descending order

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110  
papers

3,139  
citations

172457

29  
h-index

161849

54  
g-index

112  
all docs

112  
docs citations

112  
times ranked

1142  
citing authors

#	ARTICLE	IF	CITATIONS
1	Regularization of Grad's 13 moment equations: Derivation and linear analysis. <i>Physics of Fluids</i> , 2003, 15, 2668-2680.	4.0	390
2	Heliostat field optimization: A new computationally efficient model and biomimetic layout. <i>Solar Energy</i> , 2012, 86, 792-803.	6.1	247
3	Regularized 13-moment equations: shock structure calculations and comparison to Burnett models. <i>Journal of Fluid Mechanics</i> , 2004, 513, 171-198.	3.4	205
4	Modeling Nonequilibrium Gas Flow Based on Moment Equations. <i>Annual Review of Fluid Mechanics</i> , 2016, 48, 429-458.	25.0	150
5	Boundary conditions for regularized 13-moment-equations for micro-channel-flows. <i>Journal of Computational Physics</i> , 2008, 227, 1982-2011.	3.8	140
6	Compact third-order limiter functions for finite volume methods. <i>Journal of Computational Physics</i> , 2009, 228, 4118-4145.	3.8	126
7	A solution algorithm for the fluid dynamic equations based on a stochastic model for molecular motion. <i>Journal of Computational Physics</i> , 2010, 229, 1077-1098.	3.8	110
8	Fokker-Planck model for computational studies of monatomic rarefied gas flows. <i>Journal of Fluid Mechanics</i> , 2011, 680, 574-601.	3.4	103
9	Couette and Poiseuille microflows: Analytical solutions for regularized 13-moment equations. <i>Physics of Fluids</i> , 2009, 21, .	4.0	94
10	A robust numerical method for the R13 equations of rarefied gas dynamics: Application to lid driven cavity. <i>Journal of Computational Physics</i> , 2013, 236, 169-186.	3.8	85
11	$H$ Theorem, Regularization, and Boundary Conditions for Linearized 13 Moment Equations. <i>Physical Review Letters</i> , 2007, 99, 014502.	7.8	83
12	Higher-order effects in rarefied channel flows. <i>Physical Review E</i> , 2008, 78, 046301.	2.1	68
13	Affordable robust moment closures for CFD based on the maximum-entropy hierarchy. <i>Journal of Computational Physics</i> , 2013, 251, 500-523.	3.8	64
14	Two-Dimensional Bulk Microflow Simulations Based on Regularized Grad's 13-Moment Equations. <i>Multiscale Modeling and Simulation</i> , 2006, 5, 695-728.	1.6	55
15	Application of time reverse modeling on ultrasonic non-destructive testing of concrete. <i>Applied Mathematical Modelling</i> , 2011, 35, 807-816.	4.2	46
16	Hyperbolic Moment Equations in Kinetic Gas Theory Based on Multi-variate Pearson-IV-distributions. <i>Communications in Computational Physics</i> , 2010, 7, 639-673.	1.7	46
17	Uniqueness conditions for Riemann problems of ideal magnetohydrodynamics. <i>Journal of Plasma Physics</i> , 2003, 69, 253-276.	2.1	44
18	Locally Divergence-preserving Upwind Finite Volume Schemes for Magnetohydrodynamic Equations. <i>SIAM Journal of Scientific Computing</i> , 2005, 26, 1166-1191.	2.8	42

#	ARTICLE	IF	CITATIONS
19	Model Reduction of Kinetic Equations by Operator Projection. <i>Journal of Statistical Physics</i> , 2016, 162, 457-486.	1.2	42
20	The shock tube study in extended thermodynamics. <i>Physics of Fluids</i> , 2001, 13, 2423-2432.	4.0	41
21	A framework for hyperbolic approximation of kinetic equations using quadrature-based projection methods. <i>Kinetic and Related Models</i> , 2014, 7, 531-549.	0.9	39
22	Macroscopic description of steady and unsteady rarefaction effects in boundary value problems of gas dynamics. <i>Continuum Mechanics and Thermodynamics</i> , 2009, 21, 423-443.	2.2	38
23	Non-uniform convergence of finite volume schemes for Riemann problems of ideal magnetohydrodynamics. <i>Journal of Computational Physics</i> , 2003, 192, 73-94.	3.8	37
24	Constraint-Preserving Upwind Methods for Multidimensional Advection Equations. <i>SIAM Journal on Numerical Analysis</i> , 2004, 42, 1694-1728.	2.3	35
25	Characteristic waves and dissipation in the 13-moment-case. <i>Continuum Mechanics and Thermodynamics</i> , 2000, 12, 289-301.	2.2	33
26	Essentially optimal explicit Runge-Kutta methods with application to hyperbolic-parabolic equations. <i>Numerische Mathematik</i> , 2007, 106, 303-334.	1.9	33
27	Slow gas microflow past a sphere: Analytical solution based on moment equations. <i>Physics of Fluids</i> , 2010, 22, .	4.0	32
28	Regularized 13 moment equations for hard sphere molecules: Linear bulk equations. <i>Physics of Fluids</i> , 2013, 25, .	4.0	29
29	Convergence Study of Moment Approximations for Boundary Value Problems of the Boltzmann-BGK Equation. <i>Communications in Computational Physics</i> , 2015, 18, 529-557.	1.7	29
30	Numerical Study of Partially Conservative Moment Equations in Kinetic Theory. <i>Communications in Computational Physics</i> , 2017, 21, 981-1011.	1.7	26
31	Explicit fluxes and productions for large systems of the moment method based on extended thermodynamics. <i>Continuum Mechanics and Thermodynamics</i> , 2003, 15, 97-111.	2.2	22
32	Hierarchical Boltzmann simulations and model error estimation. <i>Journal of Computational Physics</i> , 2017, 342, 66-84.	3.8	22
33	High order WENO schemes: investigations on non-uniform convergence for MHD Riemann problems. <i>Journal of Computational Physics</i> , 2004, 201, 586-600.	3.8	21
34	On curl-preserving finite volume discretizations for shallow water equations. <i>BIT Numerical Mathematics</i> , 2006, 46, 35-53.	2.0	21
35	Numerical Simulation of Microflows Using Moment Methods with Linearized Collision Operator. <i>Journal of Scientific Computing</i> , 2018, 74, 336-374.	2.3	21
36	On Stable Wall Boundary Conditions for the Hermite Discretization of the Linearised Boltzmann Equation. <i>Journal of Statistical Physics</i> , 2018, 170, 101-126.	1.2	20

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37	Automated Boltzmann collision integrals for moment equations. AIP Conference Proceedings, 2012, , .	0.4	19
38	Higher order moment equations for rarefied gas mixtures. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2015, 471, 20140754.	2.1	19
39	On Singular Closures for the 5-Moment System in Kinetic Gas Theory. Communications in Computational Physics, 2015, 17, 371-400.	1.7	19
40	Relations Between WENO3 and Third-Order Limiting in Finite Volume Methods. Journal of Scientific Computing, 2016, 68, 624-652.	2.3	18
41	Special issues on moment methods in kinetic gas theory. Continuum Mechanics and Thermodynamics, 2009, 21, 341-343.	2.2	16
42	Approximation of the linearized Boltzmann collision operator for hard-sphere and inverse-power-law models. Journal of Computational Physics, 2015, 295, 617-643.	3.8	16
43	On the Holway-Weiss debate: Convergence of the Grad-moment-expansion in kinetic gas theory. Physics of Fluids, 2019, 31, .	4.0	16
44	H-Theorem for nonlinear regularized 13-moment equations in kinetic gas theory. Kinetic and Related Models, 2012, 5, 185-201.	0.9	16
45	Comparison of relaxation phenomena in binary gas-mixtures of Maxwell molecules and hard spheres. Computers and Mathematics With Applications, 2015, 70, 73-88.	2.7	15
46	Regularized moment equations for binary gas mixtures: Derivation and linear analysis. Physics of Fluids, 2016, 28, 042003.	4.0	15
47	The 35-Moment System with the Maximum-Entropy Closure for Rarefied Gas Flows. European Journal of Mechanics, B/Fluids, 2017, 64, 30-40.	2.5	15
48	Formulation of moment equations for rarefied gases within two frameworks of non-equilibrium thermodynamics: RET and GENERIC. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2020, 378, 20190174.	3.4	15
49	Hyperbolic moment equations using quadrature-based projection methods. AIP Conference Proceedings, 2014, , .	0.4	14
50	Efficient algorithms and implementations of entropy-based moment closures for rarefied gases. Journal of Computational Physics, 2017, 340, 138-159.	3.8	14
51	Higher-order moment theories for dilute granular gases of smooth hard spheres. Journal of Fluid Mechanics, 2018, 836, 451-501.	3.4	14
52	Increasing the accuracy in locally divergence-preserving finite volume schemes for MHD. Journal of Computational Physics, 2008, 227, 3405-3427.	3.8	13
53	Comment on "Thermodynamically Admissible 13 Moment Equations from the Boltzmann Equation"; Physical Review Letters, 2010, 105, 128901; author reply 128902.	7.8	13
54	Krylov-Riemann Solver for Large Hyperbolic Systems of Conservation Laws. SIAM Journal of Scientific Computing, 2012, 34, A2072-A2091.	2.8	13

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55	Entropic quadrature for moment approximations of the Boltzmann-BGK equation. Journal of Computational Physics, 2020, 401, 108992.	3.8	13
56	Evaporation Boundary Conditions for the Linear R13 Equations Based on the Onsager Theory. Entropy, 2018, 20, 680.	2.2	12
57	Two-Dimensional Simulation of Rarefied Gas Flows Using Quadrature-Based Moment Equations. Multiscale Modeling and Simulation, 2018, 16, 1059-1084.	1.6	11
58	Entropic Fokker-Planck kinetic model. Journal of Computational Physics, 2021, 430, 110034.	3.8	11
59	Stability and consistency of kinetic upwinding for advection-diffusion equations. IMA Journal of Numerical Analysis, 2006, 26, 686-722.	2.9	9
60	Modeling Micro Mass and Heat Transfer for Gases Using Extended Continuum Equations. Journal of Heat Transfer, 2009, 131, .	2.1	9
61	Heat transfer in micro devices packaged in partial vacuum. Journal of Physics: Conference Series, 2012, 362, 012034.	0.4	9
62	Numerical solution of hyperbolic moment models for the Boltzmann equation. European Journal of Mechanics, B/Fluids, 2017, 64, 41-46.	2.5	9
63	Gaussian Process Regression for Maximum Entropy Distribution. Journal of Computational Physics, 2020, 418, 109644.	3.8	9
64	Consistent, explicit, and accessible Boltzmann collision operator for polyatomic gases. Physical Review E, 2021, 104, 025309.	2.1	9
65	Entropy stable Hermite approximation of the linearised Boltzmann equation for inflow and outflow boundaries. Journal of Computational Physics, 2018, 369, 16-44.	3.8	8
66	Finite element methods for the linear regularized 13-moment equations describing slow rarefied gas flows. Journal of Computational Physics, 2019, 389, 1-21.	3.8	8
67	Scale-Induced Closure for Approximations of Kinetic Equations. Journal of Statistical Physics, 2010, 141, 848-888.	1.2	7
68	Convergence Analysis of Grad's Hermite Expansion for Linear Kinetic Equations. SIAM Journal on Numerical Analysis, 2020, 58, 1164-1194.	2.3	7
69	A deterministic model of electron transport for electron probe microanalysis. IOP Conference Series: Materials Science and Engineering, 2018, 304, 012004.	0.6	6
70	-theorem and boundary conditions for the linear R26 equations: application to flow past an evaporating droplet. Journal of Fluid Mechanics, 2021, 924, .	3.4	6
71	Slow rarefied gas flow past a cylinder: Analytical solution in comparison to the sphere. , 2012, , .		5
72	Regularized 13 moment equations for hard spheres. , 2012, , .		5

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73	On third-order limiter functions for finite volume methods. Bulletin of the Brazilian Mathematical Society, 2016, 47, 753-764.	0.8	5
74	Reprint of: Comparison of relaxation phenomena in binary gas-mixtures of Maxwell molecules and hard spheres. Computers and Mathematics With Applications, 2016, 72, 271-287.	2.7	5
75	fenicsR13. ACM Transactions on Mathematical Software, 2021, 47, 1-29.	2.9	5
76	Modeling of electric arcs: A study of the non-convective case with strong coupling. Journal of Plasma Physics, 2013, 79, 699-713.	2.1	4
77	Simultaneous-approximation-term based boundary discretization for moment equations of rarefied gas dynamics. Journal of Computational Physics, 2020, 407, 109243.	3.8	4
78	Flexible Stability Domains for Explicit Runge-Kutta Methods. Series in Contemporary Applied Mathematics, 2007, , 152-180.	0.8	4
79	High-Resolution Quantification Across Vertical Interfaces using a Monte Carlo Based Reconstruction Approach. Microscopy and Microanalysis, 2013, 19, 1296-1297.	0.4	3
80	On a hyperbolic conservation law of electron transport in solid materials for electron probe microanalysis. Bulletin of the Brazilian Mathematical Society, 2016, 47, 575-588.	0.8	3
81	Curvature-induced instability of a Stokes-like problem with non-standard boundary conditions. Applied Numerical Mathematics, 2017, 121, 96-114.	2.1	3
82	Hypersonics simulations based on the Regularized Grad equations for multicomponent plasmas. , 2011, , .		2
83	Regularized Grad equations for multicomponent plasmas. , 2011, , .		2
84	A new closure mitigating the sub-shock phenomenon in the continuous shock-structure problem. Proceedings in Applied Mathematics and Mechanics, 2013, 13, 499-500.	0.2	2
85	A Hybrid Riemann Solver for Large Hyperbolic Systems of Conservation Laws. SIAM Journal of Scientific Computing, 2017, 39, A2911-A2934.	2.8	2
86	Stability of reduced electric arc models. Proceedings in Applied Mathematics and Mechanics, 2007, 7, 1141301-1141302.	0.2	1
87	Stabilization techniques in finite element discretizations for moment approximations. , 2014, , .		1
88	Numerical simulation of large hyperbolic moment systems with linear and relaxation production terms. , 2014, , .		1
89	Simplified Hyperbolic Moment Equations. Springer Proceedings in Mathematics and Statistics, 2018, , 221-232.	0.2	1
90	Moment method for the Boltzmann equation of reactive quaternary gaseous mixture. Physica A: Statistical Mechanics and Its Applications, 2021, 574, 125874.	2.6	1

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91	Solenoidal Discrete Initialization for Magnetohydrodynamics. , 2005, , 235-253.		1
92	Compact Third-Order Logarithmic Limiting for Nonlinear Hyperbolic Conservation Laws. , 2008, , 347-354.		1
93	REGULARIZATION AND BOUNDARY CONDITIONS FOR THE 13 MOMENT EQUATIONS. , 2008, , .		1
94	The Riemann-Problem in Extended Thermodynamics. , 2001, , 79-88.		1
95	A Model for Characteristic X-Ray Emission in Electron Probe Microanalysis Based on the (Filtered) Spherical Harmonic () Method for Electron Transport. Microscopy and Microanalysis, 2022, 28, 454-468.	0.4	1
96	Regularized 13 moment equations for rarefied gas flows. , 2005, , 247-267.		0
97	Gas Micro-Flow Modelling Based on Regularized 13-Moment-Equations. , 2008, , .		0
98	Scale-Induced Closure for Approximations of Kinetic Equations. , 2008, , .		0
99	Numerical Simulation of Compressible Magnetohydrodynamic Plasma Flow in a Curcuit Breaker. , 2008, , .		0
100	Numerical solution of the moment equations using kinetic flux-splitting schemes. , 2012, , .		0
101	Robust hyperbolic moment closures for CFD. , 2012, , .		0
102	Trends in thermodynamics and materials theory. Continuum Mechanics and Thermodynamics, 2012, 24, 267-269.	2.2	0
103	High-Resolution Mathematical and Numerical Analysis of Involution-Constrained PDEs. Oberwolfach Reports, 2013, 10, 2691-2747.	0.0	0
104	Heat Transfer in Binary Gas Mixtures Confined in a Lid-Driven Square Cavity. Procedia Engineering, 2015, 127, 10-17.	1.2	0
105	On the moments of the Boltzmannâ€™s collision operator arising from chemical reactions. AIP Conference Proceedings, 2016, , .	0.4	0
106	Shock structure simulation using hyperbolic moment models in partially-conservative form. AIP Conference Proceedings, 2016, , .	0.4	0
107	Heat flux in binary gas mixtures confined between two parallel plates via moment equations. AIP Conference Proceedings, 2019, , .	0.4	0
108	Third-Order Limiter Functions on Non-equidistant Grids. Lecture Notes in Computational Science and Engineering, 2019, , 899-907.	0.3	0

#	ARTICLE	IF	CITATIONS
109	A Novel Reconstruction Method to Increase Spatial Resolution in Electron Probe Microanalysis. Mathematical and Computational Applications, 2021, 26, 51.	1.3	0
110	HYBRID RIEMANN SOLVERS FOR LARGE SYSTEMS OF CONSERVATION LAWS. , 2016, , .		0