Stuart Hudson

List of Publications by Year
in descending order

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Version: 2024-02-01

97 papers	1,639 citations	304743 22 h-index	377865 34 g-index
101 all docs	101 docs citations	101 times ranked	645 citing authors

#	Article	IF	Citations
1	Physics of the compact advanced stellarator NCSX. Plasma Physics and Controlled Fusion, 2001, 43, A237-A249.	2.1	161
2	Computation of multi-region relaxed magnetohydrodynamic equilibria. Physics of Plasmas, 2012, 19, .	1.9	104
3	Stellarator symmetry. Physica D: Nonlinear Phenomena, 1998, 112, 275-280.	2.8	57
4	New method to design stellarator coils without the winding surface. Nuclear Fusion, 2018, 58, 016008.	3.5	51
5	Temperature Contours and Ghost Surfaces for Chaotic Magnetic Fields. Physical Review Letters, 2008, 100, 095001.	7.8	48
6	Recent advances in the design of quasiaxisymmetric stellarator plasma configurations. Physics of Plasmas, 2001, 8, 2083-2094.	1.9	46
7	Eigenvalue problems for Beltrami fields arising in a three-dimensional toroidal magnetohydrodynamic equilibrium problem. Physics of Plasmas, 2007, 14, 052505.	1.9	38
8	Existence of three-dimensional ideal-magnetohydrodynamic equilibria with current sheets. Physics of Plasmas, 2015, 22, .	1.9	37
9	Equilibria and stability in partially relaxed plasmaâ€“vacuum systems. Nuclear Fusion, 2007, 47, 746-753.	3.5	34
10	Relaxed Plasma Equilibria and Entropy-Related Plasma Self-Organization Principles. Entropy, 2008, 10, 621-634.	2.2	34
11	Stepped pressure profile equilibria in cylindrical plasmas via partial Taylor relaxation. Journal of Plasma Physics, 2006, 72, 1167.	2.1	31
12	Magnetic islands and singular currents at rational surfaces in three-dimensional magnetohydrodynamic equilibria. Physics of Plasmas, 2015, 22, .	1.9	31
13	Significance of MHD Effects in Stellarator Confinement. Fusion Science and Technology, 2006, 50, 158-170.	1.1	29
14	Eliminating Islands in High-Pressure Free-Boundary Stellarator Magnetohydrodynamic Equilibrium Solutions. Physical Review Letters, 2002, 89, 275003.	7.8	28
15	Almost invariant manifolds for divergence-free fields. Physics Letters, Section A: General, Atomic and Solid State Physics, 1994, 194, 49-56.	2.1	27
16	Boundary modulation effects on MHD instabilities in heliotrons. Nuclear Fusion, 2006, 46, 177-199.	3.5	27
17	Non-axisymmetric, multi-region relaxed magnetohydrodynamic equilibrium solutions. Plasma Physics and Controlled Fusion, 2012, 54, 014005.	2.1	26
18	The infinite interface limit of multiple-region relaxed magnetohydrodynamics. Physics of Plasmas, 2013, 20, 032509.	1.9	26

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19	Variational formulation of relaxed and multi-region relaxed magnetohydrodynamics. Journal of Plasma Physics, 2015, 81, .	2.1	25
20	Minimally Constrained Model of Self-Organized Helical States in Reversed-Field Pinches. Physical Review Letters, 2013, 111, 055003.	7.8	22
21	Pressure-driven amplification and penetration of resonant magnetic perturbations. Physics of Plasmas, 2016, 23, .	1.9	22
22	Equilibrium ?-limits in classical stellarators. Journal of Plasma Physics, 2017, 83, .	2.1	22
23	Destruction of invariant surfaces and magnetic coordinates for perturbed magnetic fields. Physics of Plasmas, 2004, 11, 677-685.	1.9	21
24	Verification of the ideal magnetohydrodynamic response at rational surfaces in the VMEC code. Physics of Plasmas, 2016, 23, .	1.9	21
25	Designing stellarator coils by a modified Newton method using FOCUS. Plasma Physics and Controlled Fusion, 2018, 60, 065008.	2.1	21
26	Calculation of cantori for Hamiltonian flows. Physical Review E, 2006, 74, 056203.	2.1	20
27	Reduction of islands in full-pressure stellarator equilibria. Physics of Plasmas, 2001, 8, 3377-3381.	1.9	19
28	Coordinate parameterisation and spectral method optimisation for Beltrami field solver in stellarator geometry. Plasma Physics and Controlled Fusion, 2020, 62, 124004.	2.1	19
29	Manipulation of islands in a heliac vacuum field. Physics Letters, Section A: General, Atomic and Solid State Physics, 1997, 226, 85-92.	2.1	18
30	Differentiating the shape of stellarator coils with respect to the plasma boundary. Physics Letters, Section A: General, Atomic and Solid State Physics, 2018, 382, 2732-2737.	2.1	18
31	Three-dimensional magnetohydrodynamic equilibria with continuous magnetic fields. Journal of Plasma Physics, 2017, 83, .	2.1	17
32	Construction of an integrable field close to any non-integrable toroidal magnetic field. Physics Letters, Section A: General, Atomic and Solid State Physics, 1998, 247, 246-251.	2.1	16
33	Verification of the SPEC code in stellarator geometries. Physics of Plasmas, 2016, 23, .	1.9	16
34	Direct prediction of nonlinear tearing mode saturation using a variational principle. Physics of Plasmas, 2020, 27, .	1.9	16
35	Analysis of perturbed magnetic fields via construction of nearby integrable fields. Physics of Plasmas, 1999, 6, 1532-1538.	1.9	15
36	Studies of spherical tori, stellarators and anisotropic pressure with the M3D code. Nuclear Fusion, 2001, 41, 739-746.	3.5	15

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37	Loss of Second-Ballooning Stability in Three-Dimensional Equilibria. Physical Review Letters, 2001, 87, 035001.	7.8	15
38	Stellarator Research Opportunities: A Report of the National Stellarator Coordinating Committee. Journal of Fusion Energy, 2018, 37, 51-94.	1.2	15
39	Free-boundary MRxMHD equilibrium calculations using the stepped-pressure equilibrium code. Plasma Physics and Controlled Fusion, 2020, 62, 084002.	2.1	15
40	Relaxed MHD states of a multiple region plasma. Nuclear Fusion, 2009, 49, 065019.	3.5	14
41	Pressure, chaotic magnetic fields, and magnetohydrodynamic equilibria. Physics of Plasmas, 2010, 17, .	1.9	14
42	Hessian matrix approach for determining error field sensitivity to coil deviations. Plasma Physics and Controlled Fusion, 2018, 60, 054016.	2.1	14
43	Almost-invariant surfaces for magnetic field-line flows. Journal of Plasma Physics, 1996, 56, 361-382.	2.1	13
44	Hamiltonâ€“Jacobi theory for continuation of magnetic field across a toroidal surface supporting a plasma pressure discontinuity. Physics Letters, Section A: General, Atomic and Solid State Physics, 2010, 374, 3308-3314.	2.1	13
45	Stepped pressure equilibrium with relaxed flow and applications in reversed-field pinch plasmas. Plasma Physics and Controlled Fusion, 2020, 62, 054002.	2.1	13
46	Marginal stability boundaries for infinite-nballooning modes in a quasiaxisymmetric stellarator. Physics of Plasmas, 2003, 10, 4716-4727.	1.9	12
47	Identification of important error fields in stellarators using the Hessian matrix method. Nuclear Fusion, 2019, 59, 126007.	3.5	12
48	Multi-region relaxed magnetohydrodynamic stability of a current sheet. Physics of Plasmas, 2019, 26, 030702.	1.9	12
49	Optimized finite-build stellarator coils using automatic differentiation. Nuclear Fusion, 2021, 61, 026020.	3.5	12
50	Combined plasmaâ€“coil optimization algorithms. Journal of Plasma Physics, 2021, 87, .	2.1	12
51	Ideal magnetohydrodynamic ballooning stability boundaries in three-dimensional equilibria. Physics of Plasmas, 2002, 9, 2014-2019.	1.9	11
52	NCSX Magnetic Configuration Flexibility and Robustness. Fusion Science and Technology, 2007, 51, 181-202.	1.1	11
53	Properties of Ballooning Modes in the Planar Axis Heliotron Configurations with a Large Shafranov Shift. Fusion Science and Technology, 2007, 51, 79-91.	1.1	11
54	A new class of magnetic confinement device in the shape of a knot. Physics of Plasmas, 2014, 21, 010705.	1.9	11

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55	Chaotic coordinates for the Large Helical Device. Physics of Plasmas, 2014, 21, .	1.9	10
56	Multi-region relaxed magnetohydrodynamics with flow. Physics of Plasmas, 2014, 21, 042501.	1.9	10
57	Computation of linear MHD instabilities with the multi-region relaxed MHD energy principle. Plasma Physics and Controlled Fusion, 2021, 63, 045006.	2.1	10
58	Constructing integrable high-pressure full-current free-boundary stellarator magnetohydrodynamic equilibrium solutions. Nuclear Fusion, 2003, 43, 1040-1046.	3.5	9
59	An expression for the temperature gradient in chaotic fields. Physics of Plasmas, 2009, 16, .	1.9	9
60	Theory and discretization of ideal magnetohydrodynamic equilibria with fractal pressure profiles. Physics of Plasmas, 2017, 24, .	1.9	9
61	Marginal stability diagrams for infinite-nballooning modes in quasi-symmetric stellarators. Plasma Physics and Controlled Fusion, 2004, 46, 869-876.	2.1	8
62	Magnetic-Surface Quality in Nonaxisymmetric Plasma Equilibria. Physical Review Letters, 2009, 102, 235001.	7.8	8
63	Impact of magnetic topology on radial electric field profile in the scrape-off layer of the Large Helical Device. Nuclear Fusion, 2016, 56, 092002.	3.5	8
64	Multi-region relaxed Hall magnetohydrodynamics with flow. Physics of Plasmas, 2016, 23, 082103.	1.9	8
65	Optimization of finite-build stellarator coils. Journal of Plasma Physics, 2020, 86, .	2.1	8
66	Free-boundary full-pressure island healing in stellarator equilibria: coil-healing*. Plasma Physics and Controlled Fusion, 2002, 44, 1377-1382.	2.1	7
67	Simulation of a Discharge for the NCSX Stellarator. Fusion Science and Technology, 2004, 46, 209-214.	1.1	7
68	Equilibrium and Flux Surface Issues in the Design of the NCSX. Fusion Science and Technology, 2007, 51, 145-165.	1.1	7
69	Are ghost surfaces quadratic-flux-minimizing?. Physics Letters, Section A: General, Atomic and Solid State Physics, 2009, 373, 4409-4415.	2.1	7
70	Multi-region relaxed magnetohydrodynamics with anisotropy and flow. Physics of Plasmas, 2014, 21, 072512.	1.9	7
71	Non-planar elasticae as optimal curves for the magnetic axis of stellarators. Physics of Plasmas, 2018, 25, 092508.	1.9	7
72	Model for current drive induced crash cycles in W7-X. Nuclear Fusion, 2021, 61, 126040.	3.5	7

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73	Numerical study of Î´-function current sheets arising from resonant magnetic perturbations. Physics of Plasmas, 2022, 29, .	1.9	7
74	Multi-region relaxed magnetohydrodynamics in plasmas with slowly changing boundariesâ€”Resonant response of a plasma slab. Physics of Plasmas, 2017, 24, .	1.9	6
75	Effect of ambipolar plasma flow on the penetration of resonant magnetic perturbations in a quasi-axisymmetric stellarator. Nuclear Fusion, 2005, 45, 360-367.	3.5	5
76	Steady-state solutions to the advection-diffusion equation and ghost coordinates for a chaotic flow. Physical Review E, 2007, 76, 046211.	2.1	5
77	Action-gradient-minimizing pseudo-orbits and almost-invariant tori. Communications in Nonlinear Science and Numerical Simulation, 2012, 17, 2062-2073.	3.3	5
78	Bifurcations of the magnetic axis and the alternating-hyperbolic sawtooth. Nuclear Fusion, 2020, 60, 084005.	3.5	5
79	On the non-existence of stepped-pressure equilibria far from symmetry. Plasma Physics and Controlled Fusion, 2021, 63, 125007.	2.1	5
80	Improving the stellarator through advances in plasma theory. Nuclear Fusion, 2022, 62, 042012.	3.5	5
81	Heat conduction in an irregular magnetic field. Part 2. Heat transport as a measure of the effective non-integrable volume. Journal of Plasma Physics, 2022, 88, .	2.1	5
82	Criteria for second stability for ballooning modes in stellarators. Physics of Plasmas, 2004, 11, L53-L56.	1.9	4
83	Influence of pressure-gradient and shear on ballooning stability in stellarators. Nuclear Fusion, 2005, 45, 271-275.	3.5	4
84	A regularized approach for solving magnetic differential equations and a revised iterative equilibrium algorithm. Physics of Plasmas, 2010, 17, 114501.	1.9	4
85	Computation of the Biotâ€“Savart line integral with higher-order convergence using straight segments. Physics of Plasmas, 2021, 28, 082111.	1.9	4
86	Mapping the sawtooth. Plasma Physics and Controlled Fusion, 2020, 62, 025007.	2.1	3
87	Nature of ideal MHD instabilities as described by multi-region relaxed MHD. Plasma Physics and Controlled Fusion, 2022, 64, 065001.	2.1	3
88	Chaotic particle trajectories in high-intensity finite-length charge bunches. Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 2005, 544, 458-464.	1.6	2
89	Derivatives of the local ballooning growth rate with respect to surface label, field line label, and ballooning parameter. Physics of Plasmas, 2006, 13, 042511.	1.9	2
90	Gyrokinetic magnetohydrodynamics and the associated equilibria. Physics of Plasmas, 2017, 24, 124508.	1.9	2

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91	Resistive stability of cylindrical MHD equilibria with radially localized pressure gradients. Physics of Plasmas, 2019, 26, .	1.9	2
92	Adjoint methods for quasi-symmetry of vacuum fields on a surface. Journal of Plasma Physics, 2022, 88, .	2.1	2
93	On heat conduction in an irregular magnetic field. Part 1. Journal of Plasma Physics, 2022, 88, .	2.1	2
94	Generalized action-angle coordinates defined on island chains. Plasma Physics and Controlled Fusion, 2013, 55, 014004.	2.1	1
95	Predicting nonresonant pressure-driven MHD modes in equilibria with low magnetic shear. Physics of Plasmas, 2021, 28, 012106.	1.9	1
96	Constructing Integrable Full-pressure Full-current Free-boundary Stellarator Magnetohydrodynamic Equilibria. AIP Conference Proceedings, 2003, , .	0.4	0
97	Modeling the Single-Helical Axis State in the Reversed-Field Pinch. IEEE Transactions on Plasma Science, 2014, 42, 2514-2515.	1.3	0