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Employment

Senior Lecturer

Mathematics and Statistics
School of Physics, Maths and Computing
4 Jan 2018 → present

Associate Research Physicist

Princeton Plasma Physics Laboratory
United States
15 Aug 2015 → 15 Oct 2017

Postdoctoral Research Associate

Swiss Federal Institute of Technology Lausanne
Lausanne, Switzerland
1 May 2015 → 1 Aug 2015

Graduate Research Assistant

Swiss Federal Institute of Technology Lausanne
Lausanne, Switzerland
15 Feb 2011 → 1 May 2015

Research outputs

Context and pieces of the 3D MHS puzzle
Pfefferlé, D., 26 Mar 2024.

The fine print of the magneto-hydrostatics problem
Pfefferlé, D., 21 Mar 2024.

Fascinating aspects of magneto-hydrostatics
Pfefferlé, D., 14 Mar 2024.

Development and optimisation of grid inserts for a preclinical radiotherapy system and corresponding Monte Carlo beam simulations
Fisk, M., Rowshanfarzad, P., Pfefferlé, D., Viana, M. F. D., Cabrera, J. & Ebert, M. A., 7 Mar 2024, In: Physics in Medicine & Biology. 69, 5, 055010.

Are magnetic field-lines always identifiable with 1.5D Hamiltonian systems ?
Pfefferlé, D., 14 Dec 2023.

Distribution transforms for guiding center orbit coordinates in axisymmetric tokamak equilibria
Benjamin, S., Järleblad, H., Salewski, M., Stagner, L., Hole, M. & Pfefferlé, D., Nov 2023, In: Computer Physics Communications. 292, 108893.

Dosimetric evaluation of an intraoperative radiotherapy system: a measurement-based and Monte-Carlo modelling investigation

Chin, M., Rowshanfarzad, P., Neveri, G., Ebert, M. A. & Pfefferlé, D., Jun 2023, In: Physical and Engineering Sciences in Medicine. 46, 2, p. 687-701 15 p.

Existence of global symmetries of divergence-free fields with first integrals

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Existence of global symmetries of divergence-free fields with first integrals

Perrella, D., Duignan, N. & Pfefferlé, D., 6 Mar 2023, (Unpublished) arXiv.

Euler-Poincaré reduction: a constrained variational problem framing spinning tops and fluids alike

Pfefferlé, D., Feb 2023.

Rectifiability of divergence-free fields along invariant 2-tori

Perrella, D., Pfefferlé, D. & Stoyanov, L., Aug 2022, In: Partial Differential Equations and Applications. 3, 4, 50.

Erratum: Whittle maximum likelihood estimate of spectral properties of Rayleigh-Taylor interfacial mixing using hot-wire anemometry experimental data [Phys. Rev. E 102 , 053107 (2020)]

Pfefferlé, D. & Abarzhi, S. I., 26 Jul 2022, In: Physical Review E. 106, 1, 019901.

Nifty use of cohomology for relative helicity formulae in magnetostatic

Pfefferlé, D., Feb 2022.

Numerical integration of particle orbits in discontinuous fields using VENUS-LEVIS and SPEC

Muir, D., Pfefferlé, D., Qu, Z., Hole, M. & Hegland, M., Feb 2022, In: Computer Physics Communications. 271, 108191.

Heavy impurity transport in tokamaks subject to plasma rotation, NTV and the influence of saturated ideal MHD perturbations

JET contributors, Lascas Neto, E., Graves, J. P., Raghunathan, M., Sommariva, C. & Pfefferlé, D., Jan 2022, In: Plasma Physics and Controlled Fusion. 64, 1, 014002.

Relative helicity formulae in magnetostatics from cohomological methods

Pfefferlé, D., Dec 2021.

Integrability of normal distributions Part 2: Neat foliations by manifolds with boundary

Perrella, D., Pfefferlé, D. & Stoyanov, L., 25 Nov 2021, (Unpublished) 13 p. (arXiv).

Quasisymmetric magnetic fields in asymmetric toroidal domains

Sato, N., Qu, Z., Pfefferlé, D. & Dewar, R. L., 1 Nov 2021, In: Physics of Plasmas. 28, 11, 112507 .

Analysis of the isotropic and anisotropic Grad-Shafranov equation

Jeyakumar, S., Pfefferlé, D., Hole, M. J. & Qu, Z. S., 28 Oct 2021, In: Journal of Plasma Physics. 87, 5, 905870506.

A Stefan-Sussmann theorem for normal distributions on manifolds with boundary

Perrella, D., Pfefferlé, D. & Stoyanov, L., 10 Sept 2021, (Unpublished) 12 p. (arXiv).

Gauge freedom in magnetostatics and the effect on helicity in toroidal volumes

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Combined plasma-coil optimization algorithms

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Longevity and power density of intermediate-to-deep geothermal wells in district heating applications

Hirvijoki, E., Pfefferlé, D. & Lingam, M., 25 Jan 2021, In: European Physical Journal Plus. 136, 1, 15 p., 137.

Modeling of neutral beam heating and current drive in Wendelstein 7-X

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Whittle Maximum Likelihood Estimate of spectral properties of Rayleigh-Taylor interfacial mixing using hot-wire anemometry experimental data

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Why is it so hard to generate 3D MHD equilibria with smoothly nested flux surfaces?

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Coordinate parameterisation and spectral method optimisation for Beltrami field solver in stellarator geometry

Qu, Z. S., Pfefferlé, D., Hudson, S. R., Baillod, A., Kumar, A., Dewar, R. L. & Hole, M. J., Oct 2020, In: Plasma Physics and Controlled Fusion. 62, 12, 124004.

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Pfefferlé, D., Noakes, L. & Zhou, Y., Jul 2020, In: Plasma Physics and Controlled Fusion. 62, 7, 9 p., 074004.

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Gauge freedom in magnetostatics and the effect on helicity in toroidal volumes

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Orbit physics in discontinuous fields: open questions

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Monte-Carlo/PIC methods to solve Vlasov-Boltzmann equation

Pfefferlé, D., 24 Jun 2019.

NSTX/NSTX-U theory, modeling and analysis results

Kaye, S. M., Battaglia, D. J., Baver, D., Belova, E., Berkery, J. W., Duarte, V. N., Ferraro, N., Fredrickson, E., Gorelenkov, N., Guttenfelder, W., Hao, G. Z., Heidbrink, W., Izacard, O., Kim, D., Krebs, I., La Haye, R., Lestz, J., Liu, D., Morton, L. A., Myra, J., & 71 others Pfefferlé, D., Podesta, M., Ren, Y., Riquezes, J., Sabbagh, S. A., Schneller, M., Scotti, F., Soukhanovskii, V., Zweber, S. J., Ahn, J. W., Allain, J. P., Barchfeld, R., Bedoya, F., Bell, R. E., Bertelli, N., Bhattacharjee, A., Boyer, M. D., Brennan, D., Canal, G., Canik, J., Crocker, N., Darrow, D., Delgado-Aparicio, L., Diallo, A., Domier, C., Ebrahimi, F., Evans, T., Fonck, R., Frerichs, H., Gan, K., Gerhardt, S., Gray, T., Jarboe, T., Jardin, S., Jaworski, M. A., Kaita, R., Koel, B., Kolemen, E., Kriete, D. M., Kubota, S., LeBlanc, B. P., Levinton, F., Luhmann, N., Lunsford, R., Maingi, R., Maqueda, R., Menard, J. E., Mueller, D., Myers, C. E., Ono, M., Park, J-K., Perkins, R., Poli, F., Raman, R., Reinke, M., Rhodes, T., Rowley, C., Russell, D., Schuster, E., Schmitz, O., Sechrest, Y., Skinner, C. H., Smith, D. R., Stotzfus-Dueck, T., Stratton, B., Taylor, G., Tritz, K., Wang, W., Wang, Z., Waters, I. & Wirth, B., 5 Jun 2019, In: Nuclear Fusion. 59, 11, 16 p., 112007.

Guiding-centre theory for kinetic-magnetohydrodynamic modes in strongly flowing plasmas

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Rigidity of MHD equilibrium states to smooth ideal motion

Pfefferlé, D. & Noakes, L., 28 Mar 2019.

Heavy impurity transport in tokamaks with plasma flows and saturated 3D perturbations

Neto, E., Graves, J. P., Raghunathan, M., Lanthaler, S., Pfefferlé, D., Cooper, W. A. & Sommariva, C., 2019.

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What may the experimental and numerical data tell us on properties of Rayleigh-Taylor interfacial mixing?

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Pfefferlé, D., Noakes, L. & Mangalath, V., Nov 2018.

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The effect of magnetic equilibrium on auxiliary heating schemes and fast particle confinement in Wendelstein 7-X

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Modelling of NSTX hot vertical displacement events using M3D-C1

Pfefferlé, D., Ferraro, N., Jardin, S. C., Krebs, I. & Bhattacharjee, A., 2 May 2018, In: Physics of Plasmas. 25, 5, p. 056106 056106.

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Raghunathan, M., Graves, J. P., Nicolas, T., Cooper, W. A., Garbet, X. & Pfefferlé, D., 9 Oct 2017, In: Plasma Physics and Controlled Fusion. 59, 12, 124002.

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Lanthaler, S., Pfefferlé, D., Graves, J. P. & Cooper, W. A., 15 Mar 2017, In: Plasma Physics and Controlled Fusion. 59, 4, 044014.

The DEMO wall load challenge
Wenninger, R., Albanese, R., Ambrosino, R., Arbeiter, F., Aubert, J., Bachmann, C., Barbato, L., Barrett, T., Beckers, M., Biel, W., Boccaccini, L., Carralero, D., Coster, D., Eich, T., Fasoli, A., Federici, G., Firdaouss, M., Graves, J. P., Horacek, J., Kovari, M., & 17 others Lanthaler, S., Loschiavo, V., Lowry, C., Lux, H., Maddaluno, G., Maviglia, F., Mitteau, R., Neu, R., Pfefferle, D., Schmid, K., Siccino, M., Sieglin, B., Silva, C., Snicker, A., Subba, F., Varje, J. & Zohm, H., 9 Feb 2017, In: Nuclear Fusion. 57, 4, 046002.

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Extended-MHD modeling of tokamak disruptions and resistive wall modes with M3D-C1
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Faustin, J. M., Graves, J. P., Cooper, W. A., Geiger, J. & Pfefferl , D., 1 Jan 2016, 43rd European Physical Society Conference on Plasma Physics, EPS 2016. Belgium: European Physical Society (EPS), Vol. 40A.

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Faustin, J. M., Cooper, W. A., Geiger, J., Graves, J. P. & Pfefferl , D., 10 Dec 2015, Radio Frequency Power in Plasmas: Proceedings of the 21St Topical Conference. American Institute of Physics, Vol. 1689. 060003

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Pfefferle, D., 2015

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Teaching units (UWA)

Introduction to Applied Mathematics

David Pfefferle

24/02/20 → ...

Mathematics Foundations: Applications

David Pfefferle

24/07/23 → ...

Mathematics Foundations: Specialist

David Pfefferle

27/08/18 → ...

Multivariable Calculus

David Pfefferle & Miccal Matthews

19/02/18 → ...

Radiation Physics and Dosimetry

Pejman Rowshan Farzad, Martin Ebert & David Pfefferle

29/02/20 → ...

Scientific and Industrial Modelling

David Pfefferle & Neville Fowkes

30/07/18 → ...

Topology and Analysis

David Pfefferle

25/07/22 → ...