

Dr. Steven Alexander Wright  
Senior lecturer  
Computer Science  
**Email:** steven.wright@york.ac.uk  
**Phone:** (01904) 325583



## Employment

### Lecturer

Lecturer  
Computer Science  
University of York  
United Kingdom  
30 Jul 2018 → 30 Nov 2022

### Senior Lecturer

Senior lecturer  
Computer Science  
University of York  
United Kingdom  
1 Dec 2022 → present

### Honorary Research Fellow

University of Warwick  
United Kingdom  
1 Aug 2018 → 31 Jul 2021

## Research outputs

### OP-PIC - An Unstructured-Mesh Particle-in-Cell DSL for Developing Nuclear Fusion Simulations

Lantra, Z., Wright, S. A. & Mudalige, G. R., 12 Aug 2024, *53rd International Conference on Parallel Processing Gotland, Sweden*. ACM, 14 p.

### Developing Performance Portable Plasma Edge Simulations: A Survey

Wright, S. A., Ridgers, C. P., Mudalige, G. R., Lantra, Z., Williams, J., Sunderland, A., Thorne, S. & Arter, W., May 2024, In: *Computer Physics Communications*. 298, 47 p., 109123.

### Optimizing Write Performance for Checkpointing to Parallel File Systems Using LSM-Trees

Bulut, S. & Wright, S. A., 12 Nov 2023, *SC-W '23: Proceedings of the SC '23 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis*. ACM, p. 492-501 10 p.

### Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS)

Wright, S. A., Hammond, S. D. & Jarvis, S. A., 12 Nov 2023, *2023 International Conference on High Performance Computing, Network, Storage, and Analysis, SC Workshops 2023*. p. 1229-1230 2 p. (ACM International Conference Proceeding Series).

### Software for Fusion Reactor Design: ExCALIBUR Project NEPTUNE: Towards Exascale Plasma Edge Simulations

Threlfall, E. J., Akers, R. J., Arter, W., Barnes, M., Barton, M., Cantwell, C., Challenor, P., Cook, J. W. S., Coveney, P. V., Dodwell, T., Dudson, B. D., Farrell, P. E., Goffrey, T., Green, M., Guillas, S., Hardman, M., Hill, P. A., Kimpton, L., MacMackin, C., McMillan, B., & 14 others Moxey, D., Mudalige, G. R., Omotani, J. T., Parker, J. T., Parra Diaz, F., Parry, O., Rees, T., Ridgers, C. P., Saunders, W., Sherwin, S. J., Thorne, S., Williams, J., Wright, S. A. & Yang, Y., 21 Oct 2023, *29th IAEA Fusion Energy Conference, proceedings*. 7 p.

### **An Investigation into the Performance and Portability of SYCL Compiler Implementations**

Shilpage, W. R. & Wright, S. A., 25 Aug 2023, *High Performance Computing - ISC High Performance 2023 International Workshops, Revised Selected Papers*. Bienz, A., Weiland, M., Baboulin, M. & Kruse, C. (eds.). Springer Science and Business Media Deutschland GmbH, p. 605-619 15 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 13999 LNCS).

### **Message from the Workshop Chairs**

Wright, S. A., Hammond, S. D. & Jarvis, S. A., 18 Nov 2022, *2022 IEEE/ACM International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS)*. IEEE, p. vi-vii 2 p.

### **Special Issue on Performance Modeling, Benchmarking, and Simulation of High Performance Computing Systems**

Wright, S. A., 15 Jul 2022, (E-pub ahead of print) In: *Concurrency and Computation: Practice and Experience*. 3 p.

### **Approaches to Performance Portability for Fusion Applications**

Wright, S. A., Dudson, B. D., Hill, P. A., Dickinson, D., Higgins, E., Mudalige, G. R., McMillan, B. & Goffrey, T., 11 Jul 2022

### **StressBench: A Configurable Full System Network and I/O Benchmark Framework**

Chester, D., Groves, T., Hammond, S. D., Law, T. R., Wright, S. A., Smedley-Stevenson, R., Fahmy, S. A., Mudalige, G. R. & Jarvis, S., 22 Sept 2021. 8 p.

### **EMPIRE-PIC: A Performance Portable Unstructured Particle-in-Cell Code**

Bettencourt, M. T., Brown, D. A. S., Cartwright, K. L., Cyr, E. C., Glusa, C. A., Lin, P. T., Moore, S. G., McGregor, D. A. O., Pawlowski, R., Phillips, E. G., Roberts, N. V., Wright, S. A., Maheswaran, S., Jones, J. P. & Jarvis, S., Aug 2021, In: *Communications in Computational Physics*. 30, 4, p. 1232-1268

### **Higher-Order Particle Representation for Particle-in-Cell Simulations**

Brown, D., Bettencourt, M. T., Wright, S. A., Maheswaran, S., Jones, J. P. & Jarvis, S., 8 Mar 2021, (E-pub ahead of print) In: *Journal of Computational Physics*. 435, 22 p.

### **Message from the Workshop Chairs**

Wright, S. A., Hammond, S. D. & Jarvis, S. A., 2021, In: *Proceedings of PMBS 2021: Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems, Held in conjunction with SC 2021: The International Conference for High Performance Computing, Networking, Storage and Analysis*. p. vi-vii

### **Message from the Workshop Chairs**

Wright, S. A., Hammond, S. D. & Jarvis, S. A., Nov 2020, In: *Proceedings of PMBS 2020: Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems, Held in conjunction with SC 2020: The International Conference for High Performance Computing, Networking, Storage and Analysis*. p. vi-vii 9307850.

### **Warwick Data Store: A Data Structure Abstraction Library**

Kirk, R. O., Noltén, M., Kevis, R., Law, T. R., Maheswaran, S., Wright, S. A., Powell, S., Mudalige, G. R. & Jarvis, S. A., Nov 2020, *Proceedings of PMBS 2020: Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems, Held in conjunction with SC 2020: The International Conference for High Performance Computing, Networking, Storage and Analysis*. IEEE, p. 71-85 15 p. 9307883. (Proceedings of PMBS 2020: Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems, Held in conjunction with SC 2020: The International Conference for High Performance Computing, Networking, Storage and Analysis).

### **An Unstructured CFD Mini-Application for the Performance Prediction of a Production CFD Code**

Owenson, A., Wright, S. A., Bunt, R., Ho, Y., Street, M. & Jarvis, S., 25 May 2020, In: *Concurrency and Computation: Practice and Experience*. 32, 10, 14 p., e5443.

### **Message from the Workshop Chairs**

Wright, S. A., Jarvis, S. A. & Hammond, S. D., Nov 2019, In: *Proceedings of PMBS 2019: Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems - Held in conjunction with SC 2019: The International Conference for High Performance Computing, Networking, Storage and Analysis*. p. v-vi 9059259.

### **Full-System Modeling and Simulation: Contributions Towards Coupling Contention and I/O**

Chester, D., Wright, S. A., Hammond, S. D., Law, T. R., Smedley-Stevenson, R., Maheswaran, S. & Jarvis, S. A., 15 Aug 2019.

### **The Power-Optimised Software Envelope**

Roberts, S. I., Wright, S. A., Fahmy, S. A. & Jarvis, S. A., 1 Jun 2019, In: ACM Transactions on Architecture and Code Optimization. 16, 3, 27 p., 21.

### **An Algorithm for Computing Short-Range Forces in Molecular Dynamics Simulations with Non-Uniform Particle Densities**

Law, T. R., Hancox, J., Wright, S. A. & Jarvis, S., 28 Mar 2019, (E-pub ahead of print) In: Journal of Parallel and Distributed Computing. 130, p. 1-11 11 p.

### **Pointers inside lambda closure objects in OpenMP target offload regions**

Truby, D., Bertolli, C., Wright, S. A., Bercea, G-T., O'Brien, K. & Jarvis, S., 11 Feb 2019, *Proceedings of LLVM-HPC 2018: 5th Workshop on the LLVM Compiler Infrastructure in HPC, Held in conjunction with SC 2018: The International Conference for High Performance Computing, Networking, Storage and Analysis*. IEEE, p. 10-17 8 p. 8639410. (Technical Consortium on High Performance Computing).

### **Performance Modeling, Benchmarking and Simulation of High Performance Computing Systems**

Wright, S. A., 10 Dec 2018, (E-pub ahead of print) In: Future generation computer systems. 92, p. 900-902 3 p.

### **BookLeaf: An Unstructured Hydrodynamics Mini-application**

Truby, D., Wright, S. A., Kevis, R., Maheswaran, S., Herdman, A. & Jarvis, S. A., 10 Sept 2018. 8 p.

### **Developing and Using a Geometric Multigrid, Unstructured Grid Mini-Application to Assess Many-Core Architectures**

Owenson, A., Wright, S., Bunt, R., Jarvis, S., Ho, Y. & Street, M., 6 Jun 2018, *Proceedings - 26th Euromicro International Conference on Parallel, Distributed, and Network-Based Processing, PDP 2018*. IEEE, p. 68-76 9 p.

### **Implicit mapping of pointers inside C++ Lambda closure objects in OpenMP target offload regions**

Truby, D. R., Bertolli, C., Wright, S. A., Bercea, G-T., O'Brien, K. & Jarvis, S. A., 1 Feb 2018, (Accepted/In press).

### **Performance of a second order electrostatic particle-in-cell algorithm on modern many-core architectures**

Brown, D., Wright, S. A. & Jarvis, S. A., 20 Nov 2017, *UK Performance Engineering Workshop (UKPEW'17)*.

### **Performance of second order particle-in-cell methods on modern many-core architectures**

Brown, D., Bettencourt, M. T., Wright, S. A., Jones, J. P. & Jarvis, S. A., 1 Oct 2017, (Accepted/In press).

### **Achieving performance portability for a heat conduction solver mini-application on modern multi-core systems**

Kirk, R. O., Mudalige, G. R., Reguly, I. Z., Wright, S. A., Martineau, M. J. & Jarvis, S. A., 26 Sept 2017, *Proceedings - 2017 IEEE International Conference on Cluster Computing, CLUSTER 2017*. IEEE, Vol. 2017-September. p. 834-841 8 p. 8049026

### **Metrics for energy-aware software optimisation**

Roberts, S. I., Wright, S. A., Fahmy, S. A. & Jarvis, S. A., 12 May 2017, (E-pub ahead of print) *High Performance Computing - 32nd International Conference, ISC High Performance 2017, Proceedings*. Springer, Vol. 10266 LNCS. p. 413-430 18 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 10266 LNCS).

### **7th international workshop on performance modeling, benchmarking and simulation of high performance computing systems (PMBS 2016)**

Jarvis, S. A., Wright, S. A. & Hammond, S. D., 2 Feb 2017, In: *Proceedings of PMBS 2016: 7th International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computing Systems - Held in conjunction with SC 2016: The International Conference for High Performance Computing, Networking, Storage and Analysis*. p. v-vi 7836407.

#### **Replicating HPC I/O workloads with proxy applications**

Dickson, J., Wright, S., Maheswaran, S., Herdman, A., Miller, M. C. & Jarvis, S. A., 2 Feb 2017, *Proceedings of PDSW-DISCS 2016: 1st Joint International Workshop on Parallel Data Storage and Data Intensive Scalable Computing Systems - Held in conjunction with SC16: The International Conference for High Performance Computing, Networking, Storage and Analysis*. IEEE, p. 13-18 6 p. 7836562

#### **Predictive Evaluation of Partitioning Algorithms through Runtime Modelling**

Bunt, R. A., Wright, S. A., Jarvis, S. A., Ho, Y. K. & Street, M. J., 1 Feb 2017, *Proceedings - 23rd IEEE International Conference on High Performance Computing, HiPC 2016*. IEEE, p. 351-361 11 p. 7839701. (IEEE International Conference on High Performance Computing).

#### **Optimisation of a Molecular Dynamics Simulation of Chromosome Condensation**

Law, T. R., Hancox, J., Cheng, T. M. K., Chaleil, R. A. G., Wright, S. A., Bates, P. A. & Jarvis, S. A., 16 Dec 2016, *Proceedings - 28th IEEE International Symposium on Computer Architecture and High Performance Computing, SBAC-PAD 2016*. IEEE Computer Society, p. 126-133 8 p. 7789332

#### **POSE: A mathematical and visual modelling tool to guide energy aware code optimisation**

Roberts, S., Wright, S., Lecomber, D., January, C., Byrd, J., Oro, X. & Jarvis, S. A., 26 Jan 2016, *2015 6th International Green and Sustainable Computing Conference*. IEEE, 7393705

#### **Quantifying the Effects of Contention on Parallel File Systems**

Wright, S. A. & Jarvis, S. A., 29 Sept 2015, *Proceedings - 2015 IEEE 29th International Parallel and Distributed Processing Symposium Workshops, IPDPSW 2015*. IEEE, p. 932-940 9 p. 7284412

#### **High performance computing systems: Performance modeling, benchmarking, and simulation: 5th international workshop, PMBS 2014 New Orleans, LA, USA, november 16, 2014 revised selected papers**

Jarvis, S. A., Wright, S. A. & Hammond, S. D., 1 Jan 2015, *High Performance Computing Systems: Performance Modeling, Benchmarking, and Simulation - 5th International Workshop, PMBS 2014, Revised Selected Papers*. Springer, Vol. 8966. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 8966).

#### **Monitoring, analysis and optimisation of I/O in parallel applications**

Wright, S. A., 1 Nov 2014

#### **High Performance Computing Systems: Performance Modeling, Benchmarking and Simulation: 4th International Workshop, PMBS 2013 Denver, CO, USA, November 18, 2013 Revised Selected Papers**

Jarvis, S. A., Wright, S. & Hammond, S., 1 Jan 2014, *High Performance Computing Systems: Performance Modeling, Benchmarking and Simulation - 4th International Workshop, PMBS 2013, Revised Selected Papers*. Springer, Vol. 8551. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 8551).

#### **Performance modelling of magnetohydrodynamics codes**

Bird, R. F., Wright, S. A., Beckingsale, D. A. & Jarvis, S. A., 1 Mar 2013, *Computer Performance Engineering - 9th European Workshop, EPEW 2012, Revised Selected Papers*. Vol. 7587 LNCS. p. 197-209 13 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 7587 LNCS).

#### **Parallel file system analysis through application I/O Tracing**

Wright, S. A., Hammond, S. D., Pennycook, S. J., Bird, R. F., Herdman, J. A., Miller, I., Vadgama, A., Bhalerao, A. & Jarvis, S. A., 1 Feb 2013, In: *Computer Journal*. 56, 2, p. 141-155 15 p.

#### **An investigation of the performance portability of OpenCL**

Pennycook, S. J., Hammond, S. D., Wright, S. A., Herdman, J. A., Miller, I. & Jarvis, S. A., 1 Jan 2013, In: *Journal of Parallel and Distributed Computing*. 73, 11, p. 1439-1450 12 p.

### **Towards the automated generation of hard disk models through physical geometry discovery**

Wright, S. A., Pennycook, S. J. & Jarvis, S. A., 1 Dec 2012, *Proceedings - 2012 SC Companion: High Performance Computing, Networking Storage and Analysis, SCC 2012*. p. 437-445 9 p. 6495845

### **LDPLFS: Improving I/O performance without application modification**

Wright, S. A., Hammond, S. D., Pennycook, S. J., Miller, I., Herdman, J. A. & Jarvis, S. A., 18 Oct 2012, *Proceedings of the 2012 IEEE 26th International Parallel and Distributed Processing Symposium Workshops, IPDPSW 2012*. p. 1352-1359 8 p. 6270802

### **On the acceleration of wavefront applications using distributed many-core architectures**

Pennycook, S. J., Hammond, S. D., Mudalige, G. R., Wright, S. A. & Jarvis, S. A., 1 Feb 2012, In: *Computer Journal*. 55, 2, p. 138-153 16 p.

### **Light-weight parallel I/O analysis at scale**

Wright, S. A., Hammond, S. D., Pennycook, S. J. & Jarvis, S. A., 1 Dec 2011, *Computer Performance Engineering - 8th European Performance Engineering Workshop, EPEW 2011, Proceedings*. Vol. 6977 LNCS. p. 235-249 15 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 6977 LNCS).

## **Activities**

### **Project NEPTUNE: Developing Performance Portable Plasma Edge Simulations**

Steven Alexander Wright (Invited speaker)  
11 Jul 2024

### **FM-WP4 Software Support Procurement**

Steven Alexander Wright (Speaker)  
6 Mar 2024

### **14th International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems**

Steven Alexander Wright (Chair)  
13 Nov 2023

### **Approaches to Developing Performance Portable Scientific Software**

Steven Alexander Wright (Invited speaker)  
11 Oct 2023

### **Exploring the Portability of Parallel programming Models for Project NEPTUNE**

Steven Alexander Wright (Speaker)  
12 Dec 2022

### **13th IEEE International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems**

Steven Alexander Wright (Chair)  
14 Nov 2022

### **FM-WP4 Code Structure and Coordination**

Steven Alexander Wright (Speaker)  
5 Sept 2022

### **12th International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems, PMBS 2021**

Steven Alexander Wright (Chair)

15 Nov 2021

**The 11th IEEE International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems**

Steven Alexander Wright (Chair)

12 Nov 2020

**The 10th IEEE International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems**

Steven Alexander Wright (Chair)

18 Nov 2019

**The 9th IEEE International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems**

Steven Alexander Wright (Chair)

12 Nov 2018

## **Awards**

**EPOC++ a future-proofed kinetic simulation code for plasma physics at exascale**

Wright, S. A.

EPSRC: £228,071.20

1/10/22 → 30/09/25

## **Projects**

**EPOC++ a future-proofed kinetic simulation code for plasma physics at exascale**

Wright, S. A.

EPSRC

1/10/22 → 30/09/25

**STEP Plasma modelling - Scrape off layer turbulence simulations**

Dudson, B. D. & Wright, S. A.

10/06/19 → 31/03/24