

Curriculum Vitae

SJ Spencer

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Work & Education

- 2017 - present: PhD in Physics, University of Warwick
 - Project Title: Laser-plasma interactions relevant to shock-ignition inertial confinement fusion.
 - Fully-funded by National Productivity Investment Fund until October 2021.
 - Supervisor: [Professor Tony Arber](#).
- Winter Quarter 2020: Junior Specialist, University of California San Diego
 - Ran particle-in-cell simulations of magnetised plasmas in support of an experiment performed on the LULI laser system. Responsible for elucidating the role of kinetic effects on measured transmitted light, SRS-reflectivity, and SBS-reflectivity.
 - Supervisor: [Professor Farhat Beg](#).
- 2014 - 2017 : BSc (Hons) Mathematics, University of Warwick
 - In my final year I completed a mixture of undergraduate and masters-level courses in: Algebraic Topology; Commutative Algebra; Functional Analysis; Galois Theory; Gauge Theories; History of PDEs; Relativistic Quantum Mechanics.

Publications

Published

2. **Inflationary stimulated Raman scattering in shock-ignition plasmas.**
S.J. Spencer, A. G. Seaton, T. Goffrey, and T. D. Arber
[Physics of Plasmas, Vol. 27, 122705, Dec. 2020](#)
1. **Preferential acceleration of positrons by a filamentation instability between an electron-proton beam and a pair plasma beam.**
M. E. Dieckmann, **S. J. Spencer**, and G. Rowlands
[Physics of Plasmas, Vol. 27, 122102, Dec. 2020](#)

In review

- **Electron acceleration at oblique angles via stimulated Raman scattering at laser intensities $> 10^{16} \text{Wcm}^{-2}$.**
A. Higginson, S. Zhang, M. Bailly-Grandvaux, C. McGuffey, K. Bhutwala, J. Strehlow, B. Edghill, M. Doziers, B.J. Winjum, S. Andrews, **S.J. Spencer**, N. Lemos, F. Albert, M.S. Wei, W.B. Mori, M.J.-E Manuel, and F.N. Beg
Physical Review E

In preparation

- Broadband mitigation of inflationary stimulated Raman scattering in shock-ignition
S.J. Spencer and T. D. Arber
- Simulation study of the filamentation instability between a pair plasma and an electron-ion plasma.
M. E. Dieckmann, **S.J. Spencer**, and G. Rowlands

Academic responsibilities and other relevant information

- Successful PI or Co-I for the following projects:
 - EPSRC Access to High Performance Computing 2020 - 2021: *Effects of a broadband laser driver on inflationary stimulated Raman scattering in shock-ignition*, (Awarded full request of 650,000 CPU hours).
 - ARCHER RAP 2020: *PIC Simulations of Stimulated Raman Scattering Driven by a Broadband Laser*, (Awarded full request of 7.3mAUs, equivalent to half a million CPU hours).
 - Cirrus RAP 2018-2019: *PIC Simulations of Laser-Plasma Instabilities in Shock Ignition*, (Awarded full request of three million CPU hours).
- Grants and Stipends awarded:
 - Full funding to attend University of Bordeaux Short-Pulse Lasers Summer School, 2019.
 - Full funding to attend High Energy Density Summer School at University of Michigan, 2018.
 - National Productivity Investment Fund Studentship of £80,000, including £30,000 budget for long-term attachment. PhD funding scholarship recognising exceptional achievement and potential in research students.
- Prizes:
 - August 2019: First Prize Poster Award at the High Energy Density Summer School, San Diego.
 - May 2014: Cheltenham Ladies' College - Robert Hutchings Prize for best graduating physicist.
- Academic visits:
 - Visited Prof. Farhat Beg, University of California San Diego, Winter Quarter 2020.
 - Hosted visit of Luca Antonelli (York Plasma Institute), University of Warwick, 4 November 2019.
 - Hosted visit of Prof. Mark Dieckmann (University of Linköping), University of Warwick, 29 April - 3 May 2019.
- Teaching:
 - Winter Term 2019: *Teaching Assistant, University of Warwick.*
Information Skills for Physicists.
 - Winter Term 2019: *Class Teacher, University of Warwick.*
Additional Maths for First Years. Small group teaching, working with students to bring their mathematical understanding up to the level needed for first year Physics modules.

- 2017/18 and 2018/19 Academic Years: *Class Teacher, University of Warwick*.
PX149 Mathematics for Physicists. Responsible for planning and delivering lessons to two tutorial classes per week, as well as marking assignments and giving feedback.
- Plasma physics training & summer schools:
 - August 2019: *High Energy Density Summer School, University of California, San Diego*.
Completed the Kinetic Modelling workshop under the instruction of Frank Tsung.
 - June 2019: *Short-Pulse Lasers and Applications, University of Bordeaux*.
Intensive week-long course; focused on the theory of short pulse laser generation, and their applications to laboratory astrophysics and particle source generation.
 - July 2018: *High Energy Density Summer School, University of Michigan*.
Two week-long course following the textbook “High Energy Density Physics” by R.P. Drake.
 - Spring Term 2018: *PX483 Physics for Fusion Power, University of Warwick*.
Part of the Warwick-Oxford-Imperial Centre for Postgraduate Training in Plasma Physics and High Energy Density Science.
 - November 2017: *Plasma Physics Autumn School, University of Oxford*.
 - Michaelmas Term 2017: *Kinetic Theory, University of Oxford*
Part of the Warwick-Oxford-Imperial Centre for Postgraduate Training in Plasma Physics and High Energy Density Science.
- Member of the following organisations:
 - The Institute of Physics
 - The American Physical Society
- Community Bodies, organisation & representation
 - 2019 - 2020: Athena Swan (gender equality certification) Officer for Physics department Student-Staff Liaison Committee, University of Warwick.
 - 2018 - 2019: Well-being and Health & Safety Officers for the Physics department Student-Staff Liaison Committee, University of Warwick.
- Computing:
 - **Fluent** in Python for scientific programming and data visualisation. Linux and other Unix operating systems on the command line. Use of HPC, selecting appropriate compiler suites and using batch schedulers.
 - **Proficiency/Experience** Matlab, HTML & particle-in-cell coding.
 - **Knowledge** of numerical analysis, simulations & experiments.

Selected conference attendance and presentations

Contributed talks & posters

- 12 November 2020: *62nd APS Division of Plasma Physics Meeting, Virtual*
Talk: Thresholds of inflationary stimulated Raman scattering driven by a broadband laser.
- 17 December 2019: *CLF Meeting of High Powered Laser Facility Users, Abingdon*
Talk: Inflationary stimulated Raman scattering in shock-ignition.
- September 2019 : *Inertial Fusion Sciences and Applications 2019, Osaka*
Poster: Inflationary stimulated Raman scattering in shock-ignition.
- April 2019: *49th IOP Plasma Physics Conference, Loughborough*
Talk: Inflationary stimulated Raman scattering in shock-ignition.

Invited Seminar Talks

- 29 April 2020: *Virtual Seminar Series, Centre for Fusion, Space and Astrophysics*
Talk: A whistle-stop tour of non-linear collisionless plasma wave damping.
- 16 December 2019 : *LPI Working Group meeting, Laboratory for Laser Energetics*
Talk: Simulations of inflationary stimulated Raman scattering in shock-ignition.
- 12 September 2019: *Seminar Series, First Light Fusion*
Talk: Particle-in-cell modelling of laser-plasma instabilities for shock-ignition.

References

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