Curriculum Vitae

SJ Spencer

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Address
PS1.16/17
Centre for Fusion, Space, and Astrophysics
University of Warwick
Coventry
CV4 7AL
United Kingdom

Contact
+44 (0)7531 156699
s-j.spencer@warwick.ac.uk
sj_spencer@outlook.com
Homepage
Orcid ID: 0000-0003-3096-7776

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.
- 2012 - 2014: International Baccalaureate, Cheltenham Ladies' College
  - *Final grade*: 43/45 points. *Higher-Levels*: Physics (7); Maths (6); German Language and Literature (6). *Standard-Levels*: English Literature (7); Philosophy (7); French (7). *Core-Modules*: Theory of Knowledge (A); Extended Essay (A); Creativity, Action, and Service (A).

Publications

In preparation

- Effects of an external magnetic field on Stimulated Raman Scattering as a function of $k\lambda_D$
  SJ Spencer, UCLA, UCSD
- Simulation study of the filamentation instability between a pair plasma and an electron-ion plasma.
  SJ Spencer, M. E. Dieckmann, and G. Rowlands

In review

- **Preferential acceleration of positrons by a filamentation instability between an electron-proton beam and a pair plasma beam.**
  M. E. Dieckmann, **SJ Spencer**, and G. Rowlands

- **Inflationary stimulated Raman scattering in shock-ignition plasmas.**
  SJ Spencer, A. G. Seaton, T. Goffrey, and T. D. Arber

- **Electron acceleration at oblique angles via stimulated Raman scattering at laser intensities $> \mathbf{10^{16}}\mathrm{Wcm}^{\mathbf{-2}}$.**
  A. Higginson, S. Zhang, M. Bailly-Grandvaux, C. McGuffey, K. Bhutwala, J. Strehlow, B. Edghill, M. Dozieres, 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

Academic responsibilities and other relevant information

- Successful PI or Co-I for the following projects:
  - ARCHER RAP 2020: *PIC Simulations of Stimulated Raman Scattering Driven by a Broadband Laser*, (Awarded 7.3mAUs, equivalent to half a million CPU hours).
  - Cirrus RAP 2018-2019: *PIC Simulations of Laser-Plasma Instabilities in Shock Ignition*, (Awarded 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 Linkoping), 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

- Computing:
  - **Fluent** in standard Windows MS office, Google Drive, and LaTeX typesetting. Python for scientific programming and data visualisation. Using command line Linux/Unix. Using HPC
  - **Proficiency/Experience** Matlab, HTML & particle-in-cell coding.
  - **Knowledge** of numerical analysis, simulations & experiments.

Selected conference attendance and presentations

Contributed talks & posters

- 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

Professor Tony Arber (Supervisor)
Centre for Fusion, Space, and Astrophysics
University of Warwick
Physical Science Building
Coventry
Warwickshire
CV4 7AL
t.d.arber@warwick.ac.uk
+44 24 76573872

Professor Farhat Beg (Employer)
Center for Energy Research
University of California, San Diego
SERF Building
La Jolla
California
92093-0417
cmcguffey@ucsd.edu
+01 (858) 534-6527