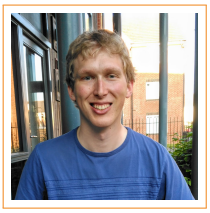

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Tom Farley

I am an experimental plasma physicist interested in the study of the tokamak scrape-of layer. I have experience analysing visible and infra-red camera data for the study of particle and energy transport respectively. I also have hands on experience working on small scale RF plasma experiments performing Langmuir probe measurements.

Education

PhD

Fusion Doctoral Training Network, **2013–**
University of Liverpool.

- Received a broad grounding in fusion research through taught courses at The University of York:
  - Courses included MCF and ICF relevant plasma physics, diagnostic techniques, data analysis, materials science, statistics, high performance computing and project management.
  - Qualified to receive the FuseNet certificate of doctoral training.

Integrated Masters

Masters in Physics with Industrial Experience, **2009–2013**
The University of Bristol, First Class Honours.

- 12 month placement at the Culham Centre for Fusion Energy resulting in a publication [6].
- Masters project in density functional theory resulted in a publication [5].
- Received letters of commendation from the head of the School of Physics in 1st and 2nd years and a project commendation for my MSci project.

Research Experience

PhD

Visual camera measurements of filamentary transport in MAST, **Jan 2016–**
Culham Centre for Fusion Energy.

- Developed the Elzar suite of analysis tools for the identification, measurement and tracking of plasma filaments in fast camera data.
- Applied pseudo Langmuir probe techniques to fast camera analysis for like with like comparison to large body of literature.
- Joined trip to the HL-2A tokamak in Chengdu, China performing reciprocating probe measurements of the effects of fuelling on scrape-off layer profiles.
- Performed experiential work for PPCF paper [3] and assisted in [4].

Measurements of negative ion surface production from diamond materials, **Jan–March 2015**
PIIM Laboratory, Aix-Marseilles University, Marseilles, France.

- Measured negative ions produced upon positive ion bombardment of diamond surfaces with a mass spectrometer and energy analyser.
- Performed first of a kind measurements of monocrystaline diamond and extensively characterised temperature dependent properties of nanocrystaline diamond, contributing to publication [1].

Characterisation of Small Negative Ion Facility, **Sep–Dec 2014**
Culham Centre for Fusion Energy.
- Commissioned the Langmuir probe and high resolution visible spectrometer diagnostics on the Small Negative Ion Facility (SNIF).
- Identified and fixed RF earthing issues, improving performance of the plasma source.
- Performed spectroscopic measurements of the ion source plasma composition, contributing to publication [2].

Langmuir probe and laser photo-detachment measurements of electronegative plasmas, **March–Sep 2014**
University of Liverpool.
- Performed laser photo-detachment measurements of negative ion density in oxygen and hydrogen magnetron plasmas under various conditions.
- Performed langmuir probe measurements of plasma density and temperature in a weakly magnetised plasma.

Masters Project

DFT calculations of the superconducting properties of the YIr_2Si_2 polymorphs, **Sep 2012–Sep 2013**
University of Bristol.
- Performed Density Functional Theory (DFT) *ab initio* calculations of the band structure and Fermi surface properties of the polymorphs of YIr_2Si_2.
- Predicted a superconducting transition temperature of $T_c = 2.58$K explained by intermediate-strength conventional electron-phonon coupling, resulting in a publication [5].

Undergraduate

Infra-red measurements of scrape-off layer power decay length in JET, **Aug 2011–Aug 2012**
Culham Centre for Fusion Energy.
- Developed the tools required to measure the plasma scrape-off layer power decay length from infra-red images of the interior of the JET tokomak.
- Analysed a large dedicated pulse database, the results of which led to a publication in Nuclear Fusion [6] and were presented by my supervisor at the 2012 IAEA conference [7].
- Tools are now used by others and have initiated similar measurements on the COMPASS tokamak.

Publications

[1] G. Cartry, D. Kogut, K. Achkasov, J.-M. Layet, T. Farley et al. *Alternative solutions to caesium in negative-ion sources: a study of negative-ion surface production on diamond in H 2 /D 2 plasmas*. New J. Phys., **19** (4):25010 (2017).

[2] J. Zacks, U. Fantz, T. Farley I. Turner, R. McAdams, et al. *Characterisation of the SNIF ion source*. **030047**:030047 (2017).

[3] F. Militello, N. R. Walkden, T. Farley W. A. Gracias, J. Olsen, et al. *Multi-code analysis of scrape-off layer filament dynamics in MAST*. Plasma Phys. Control. Fusion, **58** (10):105002 (2016).

[4] N. Walkden, F. Militello, J. Harrison, T. Farley S. Silburn, et al. *Identification of intermittent transport in the scrape-off layer of MAST through high speed imaging*. Nucl. Mater. Energy, **0**:1–6 (2016).

[5] D. Billington, S. Nickau, T. Farley and J. Ward. *ElectronâĂŞPhonon Coupling and Superconducting Critical Temperature of the YIr2Si2 and LaIr2Si2 High-Temperature Polymorphs from First-Principles*. J. Phys. Soc. Japan, **83** (4):1–5 (2014).

[6] G. Arnoux, T. Farley C. Silva, S. Devaux, M. Firdaouss, et al. *Scrape-off layer properties of ITER-like limiter start-up plasmas in JET*. Nucl. Fusion, **53** (7) (2013).

[7] G. Arnoux, C. Silva, M. Brix, H. Bufferand, S. Devaux, et al. *Scrape-off Layer Properties of ITER-like Limiter Start-up Plasmas at JET*. In *Scrape-off Layer Prop. ITER-like Limiter Start-up Plasmas JET* (2012).

[8] I. Nunes, V. Riccardo, P. J. Lomas, P. D. Vries, D. Alves, et al. *Be tile power handling and main wall protection*. In *24th IAEA Fusion Energy Conf.*, pages CN–197. San Diego, USA (2012).

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Conferences and Workshops

Oral

Fusion Frontiers and Interfaces Workshop, *York*, **May 2017**
Fast Camera Analysis of Plasma Filaments.

Posters

59th Annual Meeting of the APS Division of Plasma Physics), **Oct 2017**
Milwaukee, Wisconsin, USA,
Fast Camera Analysis of Plasma Filaments.

44th IOP Plasma Physics Conference, *Oxford, UK*, **April 2017**
An Algorithm for the Analysis of Filaments in Fast Camera Data.

Fusion Frontiers and Interfaces Workshop, *York, UK*, **May 2016**
Pseudo Langmuir Probe Analysis of Filaments in MAST Using Fast Cameras.

FuseNet PhD Workshop, *Lisbon, Portugal*, **Nov 2014**
The SNIFF Caesium Free Negative Ion Source.

4th International Symposium on Negative Ions, Beams and Sources, **Oct 2014**
IPP Garching, Germany,
Caesium Free Negative Ion Sources.

Fusion Frontiers and Interfaces Workshop, *York, UK*, **May 2014**
Laser Photo-detachment Measurements of Negative Ion Density.

Responsibilities

Groups

Software Developers Working Group, *Member of the Culham Software Developers Working Group (SDWG)*. **2017–**
Site wide body responsible for coordinating resources for software developers.

Meetings

Coding Discussion Group, *Founder and coordinator of the Culham Coding Discussion Group (CDG).* **2017–**
Fortnightly meetings with online resources to share programming knowledge, expertise and resources.

Supervision

Masters student, Supervised masters student from University of Rome, Italy working on filament tracking for masters project. **4 months**

Undergraduate project, Supervised 3rd year undergraduate student from University of Cagliari, Italy working on filament detection for BSc project. **3 months**

Outreach

MAST-U tours: Frequently lead MAST-U tours for visitors, open evening and open day attendees

GCSE work experience: Supervised GCSE work experience student on placement at CCFE

Sun dome: Helped with sun dome science workshop at local primary school

Key Competencies

- **Experimental experience**
  - Experience working with r.f. plasma sources, compressed gas, vacuum systems and pumps and lasers.
  - Experience performing plasma measurements with langmuir probes, mass spectrometers and visible spectrometers.
- **Programming experience**
  - Experienced python programmer, OOP, TDD and HPC principals.
  - Experience with C, IDL and MATLAB.
  - Familiarity with C++, Bash scripting, Perl, Visual Basic and Fortran.
  - Experienced user of git version control and the the LaTeX typesetting language.
- **Organisational skills**
  - Excellent organisational skill, drawing up plans, maintaining detailed records and managing time effectively.
- **Communication skills**
  - Communicate technical information in a competent and accessible manner, both verbally and in writing.
  - Perform well in a team, integrating readily into different teams and environments.

Affiliations

Member of the **Institute of Physics**. **2013–**

Member of the **American Physical Society**. **2017–**

References

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upd

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UKAEA recruitment team
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January 29, 2018

Dear Sir or Madam,

I should like to express my interest in the role of *Scrape-Off Layer Turbulence Physicist*, for which I feel I am well suited...

Yours faithfully,

Tom Farley

Attached: curriculum vitæ