



## Candidate Information

<b>Position:</b>	Research Fellow
<b>School/Department:</b>	Ctre for Plasma Physics
<b>Reference:</b>	21/109273
<b>Closing Date:</b>	Monday 15 November 2021
<b>Salary:</b>	£34,304 per annum
<b>Anticipated Interview Date:</b>	Wednesday 1 or Thursday 2 December 2021
<b>Duration:</b>	Initially for 24 months with the possibility of extending it for a further 12 months

### JOB PURPOSE:

To be a highly productive, ambitious and collaborative member of the EPSRC funded research project: The new intensity frontier: exploring quantum electrodynamic plasmas (grant No: EP/V049186/1) under the supervision of Professor Gianluca Sarri. The project involves carrying out research work in ultra-high intensity laser-matter interactions, with particular emphasis on studying high-field quantum electrodynamics and the generation of extreme secondary particle and photon sources.

The successful candidate will join an established group in the field, with a vibrant network of national and international collaborators working towards the design, execution, and analysis of a series of high-profile experimental campaigns at world-leading laser facilities and particle accelerators, including the Central Laser Facility and the Stanford Linear Accelerator.

The post is a critical role, and as such, successful applicants will have responsibilities in independent research, supervision, planning, day to day lab management, outreach and collaboration both internally and externally at an international level.

### MAJOR DUTIES:

1. Undertake research under supervision within the specific research project and as a member of a well-established research group into high-intensity laser-matter interactions, high-energy and high-flux detection systems, and high-field quantum electrodynamics.
2. Carry out analyses, critical evaluations, and interpretations of experimental data and the literature using methodologies and other techniques appropriate to area of research for example this will include analysing results of experimental campaigns at national and international laser and accelerator facilities.
3. Produce high quality research outputs consistent with project aims and commensurate with career stage. This will include collaborating and co-authoring with PI and project team (as appropriate) on outputs.
4. In consultation with the project team, promote research milestones and outputs at national and international conferences and through social media (where applicable).
5. Assist grant holder in the preparation of funding proposals and applications to external bodies.
6. Carry out occasional educational supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
7. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

### Planning and Organising:

1. Plan own day-to day activity within framework of the agreed research programme.
2. Plan, in collaboration with the research group at Queen's University Belfast and with national and international partners, experimental campaigns to be carried out at large-scale laser and accelerator facilities.
3. Contribute to the planning of research project, reports and publications etc.
4. Assist PI and project team in organising relevant events (if applicable).

**Resource Management Responsibilities:**

1. Ensure research resources are used in an effective and efficient manner.
2. Provide guidance, as required, to ensure a safe working environment.

**Internal and External Relationships:**

1. Liaise on a regular basis with members of the project team.
2. Liaise on a regular basis with project partners and international collaborators.
3. Build contacts with relevant stakeholders to form relationships for future collaboration and project dissemination.

**ESSENTIAL CRITERIA:**

1. Normally have or be about to obtain a PhD in plasma physics, laser physics, or closely related discipline.
2. At least 3 years relevant research experience (relevant PhD research may be acceptable) to include:
  - Undertaking research in the area of high power laser matter interactions for the generation of high energy electron beams and secondary sources;
  - Experience with high-power laser systems and laser-plasma interactions.
  - A proven track record of using experimental models to carry out analyses, critical evaluations, and interpretations of experimental data as to the research project
  - Working effectively as part of a research team in the development and promotion of the research theme.
3. Willingness to carry out occasional educational supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
4. Ability to contribute to broader management and administrative processes.
5. Ability to contribute to the School's outreach programme by links with industry, community groups etc.
6. Sufficient breadth and depth of knowledge in the fields of high-intensity laser-matter interactions and particle acceleration.
7. Practical problem solving skills, independence of thought and initiative.
8. Ability to assess and organise resources.
9. Ability to communicate complex information in English effectively in oral and written format.
10. Ability to build relationships to develop internal and external networks.
11. Commitment to continuous professional development.
12. Ability to meet the mobility requirements of the post including the travel to large-scale laser and accelerator facilities nationally and internationally.

**DESIRABLE CRITERIA:**

1. Demonstrable post-doctoral experience in areas related to the project.
2. Expertise in numerical and analytical modelling.
3. Expertise in simulation codes, such as particle tracing, particle-in-cell, and Monte Carlo codes.
4. Strong track record of publication and of presentations at international conferences, commensurate with stage of career.
5. Demonstrable experience in working in large-scale international collaborations.
6. Demonstrable experience in contributing to the supervision of postgraduate and final year undergraduate students.
7. Sufficient breadth and depth of knowledge in high-field quantum electrodynamics.