Job Description

Job title:	Radiotherapy Research Physicist
Division:	Cancer
Board/corporate function:	Surgery and Cancer
Salary band:	Band 6
Responsible to:	Lead Research Physicist and Senior Research Physicist
Accountable to:	Head of Radiotherapy Physics
Hours per week:	37.5
Location:	Radiotherapy Physics, 5th floor West, 250 Euston Road

University College London Hospitals NHS Foundation Trust

University College London Hospitals NHS Foundation Trust (UCLH) is one of the most complex NHS trusts in the UK, serving a large and diverse population.

We provide academically led acute and specialist services, to people from the local area, from throughout the United Kingdom and overseas.

Our vision is to deliver top-quality patient care, excellent education and world-class research. We provide first-class acute and specialist services across eight sites:

- University College Hospital (incorporating the Elizabeth Garrett Anderson Wing and Grafton Way Building)
- National Hospital for Neurology and Neurosurgery
- Royal National ENT and Eastman Dental Hospitals
- Royal London Hospital for Integrated Medicine
- University College Hospital Macmillan Cancer Centre
- The Hospital for Tropical Diseases

We are dedicated to the diagnosis and treatment of many complex illnesses. UCLH specialises in women's health and the treatment of cancer, infection, neurological, gastrointestinal and oral disease. It has world class support services including critical care, imaging, nuclear medicine and pathology.

We are committed to sustainability and have pledged to become a carbon net zero health service, embedding sustainable practice throughout UCLH. We have set an ambitious target of net zero for our direct emissions by 2031 and indirect emissions by 2040

UCLH Vision and Values

The Trust is committed to delivering top quality patient care, excellent education and world-class research.

We deliver our vision through values to describe how we serve patients, their families and how we are with colleagues in the Trust and beyond.

We put your safety and wellbeing above everything

Deliver the best outcomes	Keep people safe	Reassuringly professional	Take personal responsibility

We offer you the kindness we would want for a loved one

Respect individuals	Friendly and courteous	Attentive and helpful	Protect your dignity

We achieve through teamwork

Listen and hear	Explain and involve	Work in partnership	Respect everyone's time

We strive to keep improving

Courage to give and receive feedback	Efficient and simplified	Develop through learning	Innovate and research

Equality, Diversity, and Inclusion at UCLH

At UCLH, we take equality of opportunity seriously and are committed to being a diverse and inclusive employer, with a culture that creates a real sense of belonging and trust. Respect, inclusion and sensitivity are hallmarks of quality of our care. That is why it is our fundamental aim, to recruit, retain and promote a diverse mix of people from all backgrounds, cultures, and perspectives, who are representative of our local communities to support our world class research, innovation, and creativity. We are proud to have 5 different networks that are owned and led by our staff which give a voice to all our staff to feed up to leadership of the organisation, including the Trust board, thus creating a sense of community and support and help drive cultural change to become a more inclusive organisation.

Our staff networks are:

- Black, Asian and Minority Ethnic (BAME) Network
- Lesbian, Gay, Bisexual Transgender, Queer, Intersex and Asexual (LGBTQIA+)
- Women's
- Disability Network
- Mental Health Network

Department / Division

The Surgery and Cancer Board comprises of Surgery, Cancer services and Imaging, led by the Medical Director.

The Radiotherapy Physics Department consists of Physicists, Planning Radiographers Physics practitioners (clinical technologists) and Radiotherapy Engineers. At any given time, there may also be several additional staff undertaking training in the Department, including STP and PTP Physics trainees, Radiographers rotating through Treatment Planning, Student Radiographers, Oncology Registrars and Medical Physics MSc students.

The Department is part of a multi-disciplinary team in the Department of Clinical Oncology, which sees about 2000 new patients and administers over 3000 new courses of radiotherapy treatment per year. The Department of Clinical Oncology has a varied patient base suitable for the development of complex radiotherapy including total body irradiation, paediatric practice, head and neck, and sarcoma treatments. There are also close relationships with the academic department in nuclear medicine and the academic department of oncology, which has a major research interest in targeted radioisotope therapy.

The Radiotherapy Department is located on the UCH site and the estate includes six accelerator bunkers and ten protected ward rooms. The Radiotherapy Department is equipped with four Varian TrueBEAM linear accelerators.; capable of Respiratory Gating and On-Board Imaging. One of the four machines is a stereotactic linac and two are equipped with 6DoF couch. The department has one modern orthovoltage unit and a busy Elekta High Dose Rate Flexitron unit. Planning equipment includes a Siemens Somatom confidence 64 CT simulator with full 4D imaging capabilities, including Respiratory Gating. The department also has access to PET/CT and PET/MR units for radiotherapy planning.

The Radiotherapy Physics Department provides all Dosimetry, Quality Assurance and Engineering services needed to maintain the above equipment in good and safe working order. It follows all national and international protocols and codes of practices and participates in regional, national, and international audits to ensure its dosimetry is consistent with accepted standards. The Department is actively engaged in developing and implementing new technologies to enhance the safety, accuracy, and efficacy of cancer treatment.

The Radiotherapy Physics Department supplies Treatment Planning services to Radiotherapy. Treatment planning is performed using Eclipse planning system and brachytherapy planning on Oncentra. The Department offers a variety of specialised treatment services and is continually developing advanced treatment techniques. Treatments offered include Dynamic IMRT and VMAT, SABR (lung and oligometastatic disease), SRS, IGRT, CT-based TBI; Ultrasound–guided and CT-planned HDR brachytherapy and high precision conformal radiotherapy, utilising MR/PET/CT fusion. The Department has an integrated ARIA Radiotherapy Network to transfer treatment parameters and images between the various pieces of equipment, as well as to streamline the patient flow. This network enables easy and fast Recording and Verification of complex treatments. The Radiotherapy Department as a whole has a policy of Quality Assurance for Radiotherapy and is accredited to ISO 9000-2000.

The Trust has been identified as one of the first two NHS centres to offer proton beam therapy (PBT) through an integrated service with the existing radiotherapy and radiotherapy physics

departments. The Trust is currently working with the DH and our partner site, the Christie, to deliver service and is located in the Grafton Way building. The site has direct access to the Trust's existing radiotherapy department and close to the new University College Hospital Macmillan Cancer Centre. The UK proton service brings together some of the world's leading specialists in complex cancers. Together, the Christie and UCLH will see more children and teenagers with cancer than almost any other centre in the world, and more adults with brain cancers than any other centre in the UK.

The Proton service commenced clinical treatment in 2021. The provision of Physics services to the PBT facility, at UCLH, will be provided by the radiotherapy physics group.

The Proton service is equipped with four Varian ProBEAM gantries serviced by a single cyclotron source. Proton pencil-beam scanning is standard and a single networked ARIA and Eclipse system in use across PBT and radiotherapy. The ProBEAM gantries have full imaging capabilities including planar and cone-beam CT. Pre-treatment imaging includes a dedicated MR scanner and Dual-energy CT.

The department is expected to treat up to 1000 new highly complex cases per year across the four treatment gantries. Staffing for the proton department includes clinical scientists, dosimetrists, and a team of technologists. Maintenance will be under a full-service contract with Varian Medical systems.

The Radiotherapy Physics group has a close collaborative relationship with UCL Medical Physics and Bioengineering group with several PhD projects in related areas of proton radiotherapy, Image-guided Radiotherapy and Adaptive radiotherapy.

MaThRad

MaThRad is an EPSRC funded five years interdisciplinary programme of research that is supporting the use of modern mathematical methods to develop novel approaches to the theory and application of radiation transport with focus on applications in health care and nuclear industry (mathrad.ac.uk). This programme grant unites research groups from mathematics, engineering and medical physics, leading to sustained critical mass in academic knowledge and expertise.

Job Purpose

The research physicist's main role is to participate in research projects in line with the key themes of the MaThRad research grant. This role is central to mathematical and computing applications in radiotherapy physics. The purpose of this post is to use novel methods to generate prototypes of tools for the optimization and automation of elsewise time-consuming radiotherapy physics processes including automated radiotherapy treatment planning.

The role will initially focus on the development and testing of tools for automated planning for radiotherapy. This will include coordinating projects and dissemination of results with radiotherapy physics staff. MaThRad researcher will also support other research activity within the group. While the post holder will be working within a team they will be required to work autonomously with minimal supervision.

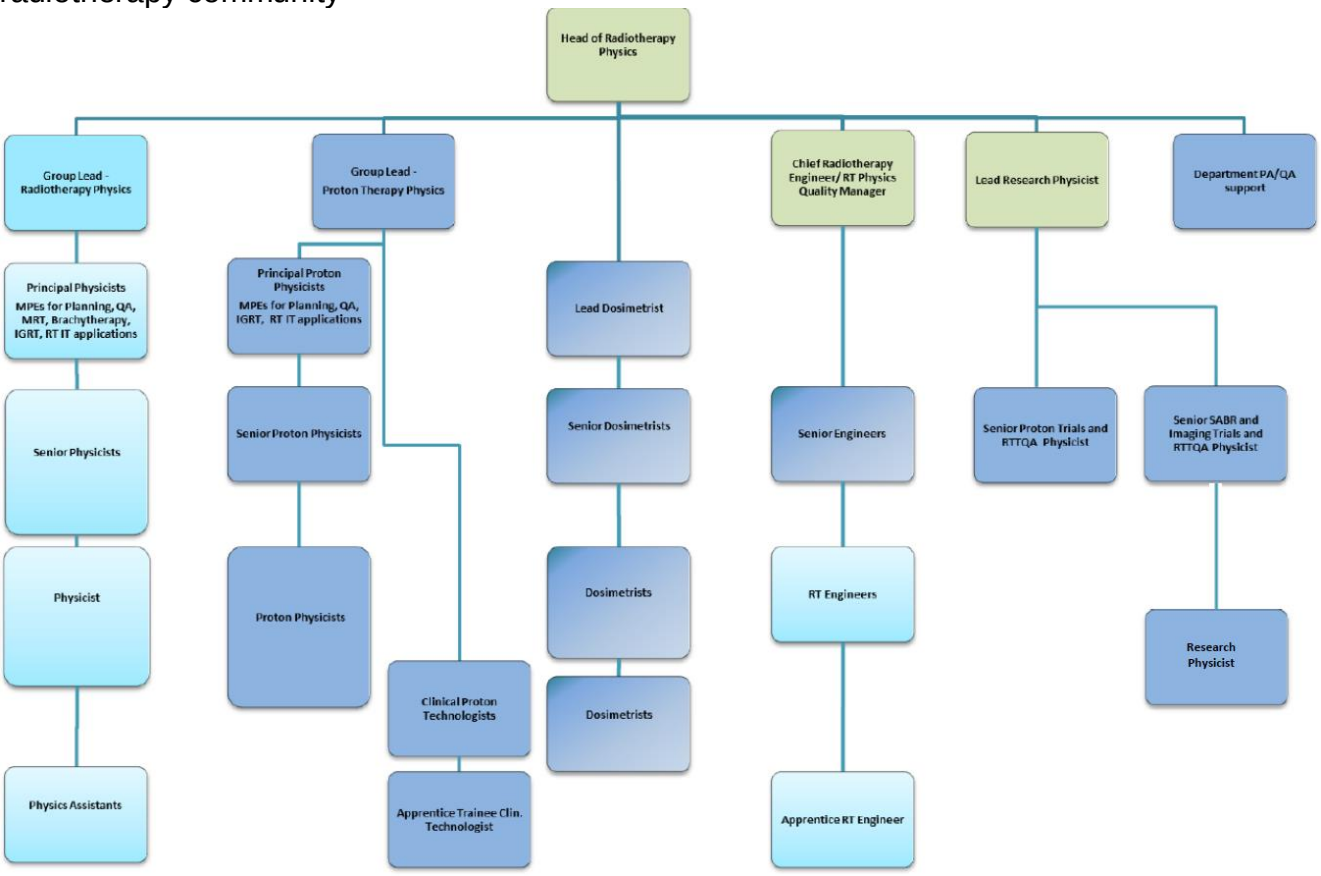
Responsibilities include promoting MaThRad activities through journal publications and conference presentations, designing conference posters, developing other written materials suitable for academics and clinical staff, organising health professional workshops, and conducting systematic literature searches and reviews.

The post holder will also be expected to support additional research that is either underway or being generated by the team. This will involve liaising with funding bodies, submitting documents for regulatory review, liaising with the relevant research authorities to gain projects approvals and maintaining project documents. The postholder is also expected to provide physics support to clinical trials.

The post is predominantly office based although MaThRad is a multicentre collaboration so there is the expectation that the post holder will accompany the team on national activities.

Key Working Relationships

Internal:
MaThRad Core team across radiotherapy physics. The post holder will be responsible to the Lead Research Physicist and Senior Research Physicist. The post holder is expected to work closely with named clinical scientists assigned by the PBT group lead and RT physics group lead in the development and testing of automation tools.
External:
MaThRad Executive team, Advisory Panel, Coordinators and Researchers, EPSRC Study Groups, radiotherapy community



Key Results Areas

To work with Radiotherapy Physics services to:

- Implement novel methods to generate prototypes of tools for the optimization and automation of treatment planning for radiotherapy.
- Provide appropriate means to support members of the team in the testing and implementation of project objectives.
- Participate in disseminating healthcare related MaThRad project results and outcomes at national and international conferences.
- Develop ways of engaging a multi-disciplinary audience, especially physicists and mathematicians.
- Manage and maintain the MaThRad research themed projects including any process documents within the Radiotherapy quality management system.
- Support the generation of additional research through conducting literature reviews and contributing to protocol development/grant submissions.
- Work with the MaThRad researchers and contribute to and actively participate in the planning and execution of MaThRad's annual Clinical Multidisciplinary Workshops.
- Responsible for maintaining existing/submitting new regulatory approvals for the MaThRad portfolio of work.

Main Duties and Responsibilities

Communication

- Work with members of the team and key stakeholders to implement the dissemination strategy.
- Responsible for interpreting complex information and presenting this in way that can be understood by academic and lay persons.
- Have presentation and writing skills of the highest calibre.

Research and development

- Comply with relevant legal requirements for the conduct of clinical research, where appropriate including GCP guidelines, General Data protection Regulations and Medicines for Human Use (Clinical Trials regulations)
- Keep up to date with current research and techniques in radiotherapy.
- Identify opportunities for research and work on the development of new project proposals for grant funding submissions.
- Lead on submitting new protocols for funding, becoming familiar with the range of research funding bodies for cancer research.
- Collaborate closely with a multidisciplinary team of researchers and clinicians to provide expert knowledge in the design, development and implementation of the research projects

undertaken. This will involve collaborations with other staff both in UCLH and elsewhere (e.g. National Physical Laboratory and Universities of Warwick, Bath and Cambridge and some of MaThRad industrial partners).

- Develop models to evaluate the impact of MaThRad research on clinical pathways.
- Aid non-clinical researchers and actively engage in research retreats, fostering collaborations with academic and industrial partners.
- Working with the team to develop models for evaluating the impact of automated planning, and methods of dissemination.

Clinical & Scientific

- To participate in development and testing of automated treatment planning techniques including, but not limited to:
  - The production for research purposes of complex computer based external beam radiotherapy treatment plans for individual patients.
  - The provision of technical advice to other staff groups.
- Working closely with other staff groups to develop and safely implement and test automated treatment techniques.

Teaching, and training

- Provide research guidance and training for students and staff temporarily or permanently attached to the Radiotherapy Physics department.
- Provide specialist training of staff in the new processes produced as a direct outcome of the research projects.
- Provide specialist training to identified staff to allow them to maintain the new processes and techniques.

Managerial

- Prioritise and manage own work.
- Work collaboratively with staff working on relevant scientific projects to ensure project timelines and goals are met.
- Provide specialist training, advice and support on own role/responsibilities where necessary.
- Ensure research activity undertaken remains within the financial constraints of the apportionment of the grant funding.
- Contribute to regular reviews of the project objectives proposing changes to processes and making recommendations to service and project development.
- Working to and maintaining the relevant section of an ISO9000 (2000) Quality System.

Keep careful records of all work performed and complete other appropriate records as required by legislation and Departmental procedures

Information Technology

Extensive and comprehensive use and support is provided by Radiotherapy Physics to the various computer systems in use in the Oncology Centre. The post holder will be required to develop a high level of working knowledge of the use of:

- The design, verification, commissioning, and management of radiotherapy treatment planning software including the accurate and exact application of highly complex treatment planning algorithms and image manipulation software.
- The radiotherapy physics computer system.
- The post holder will be required to have a good knowledge of one or more programming language and be able to develop software to support the research aims.

Professional

- Keep abreast of the latest scientific and technical developments and their applications in medical and associated fields and attend suitable seminars and courses as part of training and personal development and to further the work of the department.
- Ensure that all activities are carried out within a quality framework and conform to Statutory Regulations, Approved Codes of Practice and local safety rules.
- Monitor and maintain the health and safety of self and others they work with and ensuring trust policy is adhered to at all times.

Miscellaneous

- The post holder will always behave courteously and professionally and seek to ensure the highest level of customer service is provided.
- It may be necessary, on occasions, to work outside normal hours. Such work will, wherever possible, be compensated for by time off in lieu.
- The post holder will follow Trust policies and procedures designed to manage risks during their duties, including those from road travel, display screen use and manual handling.

General

- Adhere to the UCLH Service Commitment "Putting Patients First" and adopt a professional approach at all times.
- Comply with the Trust's Equal Opportunities Policy and treat staff, patients, colleagues and potential employees with dignity and respect at all times.
- Take personal responsibility for ensuring that UCLH resources are used efficiently and with minimum wastage, and to comply with the Trust's Standing Financial Instructions (SFIs).
- Comply with Trust policies for personal and patient safety and for prevention of healthcare-associated infection (HCAI); this includes a requirement for rigorous and consistent compliance with Trust policies for hand hygiene, use of personal protective equipment and safe disposal of sharps.
- In accordance with the Trust's responsibilities under the Civil Contingencies Act 2004, undertake work and alternative duties as reasonably directed at variable locations in the event of and for the duration of a significant internal incident, major incident or pandemic.
- Be aware of and adhere to all Trust policies and procedures, the Health and Safety at Work Act and the Data Protection Act.
- Always maintain confidentiality.
- The post requires the presentation of clinical data to medical staff and the upholding of legal requirements.

Other

The job description is not intended to be exhaustive and it is likely that duties may be altered from time to time in the light of changing circumstances and after consultation with the post holder.

You will be expected to actively participate in annual appraisals and seek to implement our Equality, Diversity and Inclusion Policy and the objective to promote equality of opportunity in relation to the duties of the post. Objectives will be set, that your performance will be monitored against in conjunction with your manager.

Sustainability at UCLH

You will be required to demonstrate a personal commitment to the Trust's Net Zero Strategy and to take personal responsibility for carrying-out your work duties in a way which is compliant with this strategy.

Person Specification

Requirements	Essential	Desirable	Assessment Criteria			
			A	I	R	T/P
Knowledge and Qualifications						
Good First Degree in a Physical Science or equivalent	**Essential**		X	**X**		
Training and/or experience in a relevant Physics or Mathematics discipline to postgraduate diploma level	**Essential**		X	**X**		
Knowledge of relevant programming language (e.g. Python, MATLAB, etc.)	**Essential**		X	**X**		
Advanced computer skills, especially in database and presentation applications	**Essential**		X	**X**		
Knowledge of radiotherapy techniques and clinical applications	**Essential**		X	**X**		
Knowledge of qualitative and quantitative research methodologies	**Essential**		X	**X**		
PhD in Physics or Mathematics or other relevant discipline		**Desirable**	X	**X**		
Knowledge of radiotherapy PBT techniques and clinical applications		**Desirable**	X	**X**		

Understanding of patient and staff risks arising from treatment planning computer system errors, equipment failure, treatment errors and incorrect dosimetry		**Desirable**	X	**X**		
Experience						
Experience in analysing and interpreting complex data produced from research projects	**Essential**		X	**X**		
Experience of conducting literature reviews	**Essential**		X	**X**		
Experience of conducting research	**Essential**		X	**X**		
Experience with software development		**Desirable**	X	**X**		
Relevant experience in Treatment Planning		**Desirable**	X	**X**		
Experience working in clinical Environment with clinical staff		**Desirable**	X	**X**		
Experience of presenting at national or international conferences		**Desirable**	X	**X**		
Experience of research within a Clinical healthcare setting		**Desirable**	X	**X**		
Skills and Abilities						
Problem solving skills and ability to adapt to unforeseen circumstances	**Essential**		**X**	**X**		
Willingness to attend courses and keep abreast of developments in the service	**Essential**		**X**	**X**		
Evidence of initiative and collaborations	**Essential**		**X**	**X**		
Excellent attention to detail	**Essential**		**X**	**X**		
Ability to work independently	**Essential**		**X**	**X**		

Values Demonstrate ability to meet Trust Values of safety, kindness, teamwork and improving	**Essential**			**X**		**X**
Communication Proven effective communication skills	**Essential**		**X**	**X**		
Ability to communicate complex information to audiences with varying backgrounds and knowledge	**Essential**		**X**	**X**		
Personal and People Development Experience of training junior Staff including (e.g. doctors, physicists, and/or radiographers)	**Essential**		**X**	**X**		
Evidence of Continuing personal development (CPD)	**Essential**		**X**	**X**		
Ability to supervise and teach junior staff	**Essential**		**X**	**X**		
Demonstrates accountability for actions	**Essential**		**X**	**X**		
Proactive in developing self and others	**Essential**		**X**	**X**		
Responsibilities towards promoting Equality Diversity and Inclusion Demonstratable understanding of the Equality, Diversity, and Inclusion and/or Knowledge of the NHS obligations under the Equality Act 2010 and the Public Sector Equality Duties	**Essential**			**X**		
Specific Requirements Willingness to work flexibly to achieve the desired project outcomes	**Essential**		**X**	**X**		

A= Application I= Interview R= References T/P = Test/Presentation