

Laser-hybrid Accelerator for Radiobiological Applications (LhARA)

The LhARA collaboration

Arizona State University: Tempe, Arizona, US

A.Sandhu, S.Tantawi

5 *Patrick G Johnston Centre for Cancer Research, Queens University Belfast, 97 Lisburn Road, Belfast, BT9 7AE, UK*
Kevin M. Prise

10 *School of Mathematics and Physics, Queen's University Belfast, University Road, Belfast, BT7 1NN, Northern Ireland, UK*
M. Borghesi, C. Palmer

15 *Dept of Medical Physics and Biomedical Engineering, University College London, WC1E 6BT*
R.A. Amos, B.T. Cox

20 *Department of Medical Physics, University Hospital Birmingham Foundation NHS Trust, Edgbaston, Birmingham, B15 2TH, UK*
S. Green

25 *Department of Cancer and Genomic Sciences, College of Medicine and Health, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK*
E.Melia, J. L. Parsons

School of Physics and Astronomy, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK
T. Price

CERN, CH-1211 Genève 23, Switzerland
A.M Lombardi

30 *Department of Physics, Lancaster University, Bailrigg, Lancaster, LA1 4YW, UK*
E. Boella¹, T.S. Dascalu¹, Stuart R. O'Neill¹, P. Ratoff¹
1. Also at Cockcroft Institute for Accelerator Science, Keckwick Ln, Daresbury, Warrington WA4 4AD

35 *Department of Physics and Astronomy, The University of Manchester, Oxford Rd, Manchester, M13 9PL, UK*
W. Bertsche¹, S. Boogert¹
1. Also at Cockcroft Institute for Accelerator Science, Keckwick Ln, Daresbury, Warrington WA4 4AD

Institut des Sciences Moléculaires d'Orsay, Rue André Rivière, Bâtiment 520, 91400 Orsay, France

Alfredo Fernandez-Rodriguez¹

40 1. Also at Institut Curie, Universit PSL, CNRS UMR3347, Inserm U1021, Signalisation Radiobiologie et Cancer, 91400 Orsay, France

Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley, CA 94720, USA

L. Obst-Huebl, A.M. Snijders

45 *Joint Department of Physics, Institute of Cancer Research and Royal Marsden NHS Foundation Trust, Sir Richard Doll Building 28 Oakleaf Avenue, Sutton, London, SM2 5GP*

J. C. Bamber, Emma J. Harris, U. Oelfke

INFN Catania, Via Santa Sofia, 64 - 95123 Catania - Italy

50 F. Romano

Department of Bioengineering, Imperial College London, Exhibition Road, London, SW7 2AZ, UK

X.Chen, S.Lyu

55 *Department of Aeronautics, Imperial College London, Exhibition Road, London, SW7 2AZ, UK*

A. Knoll

Department of Computing, Imperial College London, Exhibition Road, London, SW7 2AZ, UK

Wayne Luk

60

CRUK PPI group, Charing Cross Hospital, London, W6 8RF, UK

Harry C. Hall

Dept. Radiation Physics and Radiobiology, Imperial College Healthcare NHS Trust, London, W2 1NY, UK

65 C. Hardiman, R. McLauchlan¹

1. Also at Department of Physics, Imperial College London, Exhibition Road, London SW7 2AZ, UK

Imperial College NHS Healthcare Trust, Department of Clinical Oncology, Charing Cross Hospital, London W6 8RF, UK

70 D. Gujral

Department of Physics, Imperial College London, Exhibition Road, London, SW7 2AZ, UK

G.Casati¹, Nicholas P.Dover¹, C.Dyson¹, W. G. Jones², P.B. Jurj¹, T.J. Kuo^{1,3}, Ajit Kurup¹, Kenneth R. Long^{1,4}, M. Maxouti^{1,4}, Josie M. McGarrigle⁵, Z. Najmudin¹, J. Pasternak^{1,3}, R.Razak¹, Z. Sadhur, R. Smith, N. Zakhir

75 1. Also at The John Adams Institute for Accelerator Science, Department of Physics, Imperial College London, Exhibition Road, London SW7 2AZ, UK

2. Also at CRUK PPI group, Charing Cross Hospital, London, W6 8RF, UK

3. Also at ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, Harwell Oxford, Didcot OX11 0QX, UK

4. Also at Particle Physics Department, STFC Rutherford Appleton Laboratory, Harwell Oxford, Didcot OX11 0QX, UK

80 5. Also at Institut Curie, 73 Rue Claude Bernard, 75005, Paris, France

Department of Surgery and Cancer, Imperial College, Hammersmith Hospital London, W12 0NN, UK

D.Ariyanto, I. McNeish, P. Price

85 *Fakultät für Physik, Lehrstuhl für Medizinische Physik, Ludwig-Maximilians-Universität München, Am Coulombwall 1, D-85748 Garching, Germany*
S.Gerlach, J.Lascaud, K.Parodi, J.Schreiber

90 *Leo Cancer Care, Broadview, Windmill Hill, Hailsham, East Sussex, BN27 4RY, UK*
S. Towe, T. Underwood¹
1. Also at Dept of Medical Physics and Biomedical Engineering, University College London, WC1E 6BT

95 *Department of Physics, University of Liverpool, Liverpool, L69 7ZE, UK*
T. Greenshaw, N. Kumar¹, F.T.Parambil, M. Patel¹, H.Poptani, P. Weightman, Carsten P. Welsch¹
1. Also at Cockcroft Institute for Accelerator Science, Keckwick Ln, Daresbury, Warrington WA4 4AD

100 *National Physical Laboratory, Hampton Road, Teddington, TW11 0LW, UK*
Giuseppe Schettino

105 *Department of Oncology, University of Oxford, Old Road Campus Research Building, Roosevelt Drive, Oxford, OX3 7DQ, UK*
A. Giaccia¹
1. Also at Department of Radiation Oncology, Stanford University, Stanford, CA 94305, USA

110 *Particle Physics, Denys Wilkinson Building, Keble Rd, Oxford, OX1 3RH*
P.N. Burrows¹, M. Dosanjh¹
1. Also at The John Adams Institute for Accelerator Science, University of Oxford, Keble Rd, Oxford, OX1 3RH

115 *School of Physical and Chemical Sciences, Queen Mary University of London, Mile End Road, London, E1 4NS, UK*
P.R. Hobson

120 *Rosalind Franklin Institute, Harwell Campus, Didcot, OX11 0QX, UK*
P. Matthews¹
1. Also at Department of Brain Sciences, Faculty of Medicine, Imperial College London, Exhibition Road, London SW7 2AZ, UK

Department of Physics, Royal Holloway University of London, Egham, Surrey, TW20 0EX, UK
S. M. Gibson¹, M. Pereira¹, W. Shields¹
1. Also at The John Adams Institute for Accelerator Science, Royal Holloway University of London

125 *Accelerator Science and Technology Centre, STFC Daresbury Laboratory, Daresbury, Cheshire, WA4 4AD, UK*
J. Bebbington, R. Buckley, J. Clarke, A. Goulden, M. Johnson, K. Middleman, H. Owen, C. Pugh, A. Vick

130 *Business Innovation Department, STFC Daresbury Laboratory, Daresbury, Cheshire, WA4 4AD, UK*
M. Noro

Central Laser Facility, STFC Rutherford Appleton Laboratory, Harwell Oxford, Didcot OX11 0QX, UK
H.Ahmed, R.Pattathil

ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, Harwell Oxford, Didcot OX11 0QX, UK

J.B. Lagrange, J.W.G. Thomason

135 *Particle Physics Department, STFC Rutherford Appleton Laboratory, Harwell Oxford, Didcot, OX11 0QX, UK*
 M.Sabate-Gilarte, B.Smart

Technology Department, STFC Daresbury Laboratory, Daresbury, Cheshire, WA4 4AD, UK

N. Bliss, G. Cox, S. Griffiths, C. Hill, A. Vikhoreva

Department of Physics, SUPA, University of Strathclyde, Glasgow G4 0NG, UK

M.Alderton, Robert Bingham¹, E.Dolier, Ross J. Gray², M.King, Paul McKenna², David Spiers², B.Torrance, Colin Whyte², Robbie Wilson

1. Also at Central Laser Facility, STFC Rutherford Appleton Laboratory, Harwell Oxford, Didcot OX11 0QX, UK

145 2. Also at Cockcroft Institute for Accelerator Science, Keckwick Ln, Daresbury, Warrington WA4 4AD

Department of Biomedical Sciences, Faculty of Science and Engineering, Swansea University, Singleton Park, Swansea, SA2 8PP, UK

R.P. Hugtenburg

Department of Physics, Faculty of Science and Engineering, Swansea University, Singleton Park, Swansea, SA2 8PP, UK

C. J. Baker, M. Charlton, S. Eriksson, C.A. Isaac, P. Ruksasakchai, D. P. van der Werf

155 *Department of Radiation Oncology, University of California San Francisco, San Francisco, CA, 94115, USA*
 T. A. M. Masilela

University of Santiago de Compostela, Center for Research in Molecular Medicine and Chronic Diseases, 15782, Santiago de Compostela, Spain

160 Yolanda Prezado^{1,2}

1. Also at Institut Curie, 73 Rue Claude Bernard, 75005, Paris, France

2. Also at Institut Curie, Universit PSL, CNRS UMR3347, Inserm U1021, Signalisation Radiobiologie et Cancer, 91400 Orsay, France