Jacinta Yap

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Experience

Medical Physics Registrar & Postdoctoral Research Fellow *Sept 2025 – Present*

Physical Sciences

Department of Radiation Oncology, University of Melbourne, Australia

- Joint Research & Clinical Role
- Currently enrolled as a Radiation Oncology Medical Physicist as part of TEAP, ACPSEM
- Working on Proton Therapy and related projects
- Contributor to research project: Technology for Ultra Rapid Beam Operation (TURBO) at the University of Melbourne

Research Fellow *Oct 2020 – Sept 2025*

Medical Accelerator Physics Group

School of Physics, University of Melbourne, Australia

- Working toward technological improvements for particle therapy beam delivery (PI: Suzie Sheehy)
- Project lead: Technology for Ultra Rapid Beam Operation (TURBO) – a new system to improve efficiency and efficacy for charged particle therapy – *UniMelb profile*
- NIH R37 collaboration: A compact beam delivery system enabling ultra-fast dose delivery for upright proton therapy (PI: Konrad Nesteruk, Harvard Medical School & Mass Gen Hospital, USA)

PhD Candidate *Mar 2017 – Oct 2020*

QUASAR Group (Accelerator Physics)

Department of Physics, University of Liverpool, UK

- Development and optimisation of a standalone online beam monitoring system based on CERN LHCb VELO detector modules, adapted for ion beam therapy – *UoL profile*
- Complete characterisation of the 60 MeV proton therapy beamline at the Clatterbridge Cancer Centre (CCC) NHS Foundation Trust, Merseyside, UK
- Produced an end-to-end beamline simulation model with beam transport, particle tracking, LET & radiobiological modelling capabilities (BDSIM, Geant4 & TOPAS)
- Experimental work: 40 MeV proton cyclotron (VELO tests) and CCC clinical proton beamline (Medipix3, MiniPIX tests & film irradiations/analysis)
- Established collaborations: University College London, Royal Holloway University of London, Oxford University (UK), University of Bern (Switzerland), ADVACAM (Czech Republic), and Nikhef & Amsterdam Scientific Instruments (Netherlands)

Marie Skłodowska-Curie Actions ITN Fellow *Oct 2016 – Mar 2020*

Cockcroft Institute for Accelerator Science and Technology, UK

- Optimization of Medical Accelerators (OMA) project – European H2020 Innovative Training Network. International consortium of partner universities, research centres, ion beam treatment facilities and industry partners to address challenges in proton therapy
- WP1: Development of beam diagnostics & imaging systems
- Secondments: Industry partner ASI and research institute Nikhef; experimental design, X-ray detection, performance testing, overview of data acquisition software, fabrication & applications of novel detector technology (Medipix, Timepix, VELOpix etc). CERN with the FLUKA collaboration & EN-STI Beam Machine Interactions group; MC simulations.

Education

University of Liverpool *United Kingdom*

PhD (Physics) *Mar 2017 – Feb 2021*

- Accelerator Physics – QUASAR Group, Department of Physics
- Thesis: Characterisation Studies of Proton Beamlines for Medical Applications and Beam Diagnostics Integration (doi: 10.17638/03118222)
- Supervisors: Carsten Welsch, Javier Resta-López & Jason Parsons
- PhD awarded: 7th April 2021
- Courses: Cockcroft Institute introductory & advanced accelerator physics courses

University of Wollongong *Australia*

MSc (Medical Radiation Physics, with Distinction) *Jul 2014 – Jul 2016*

- Thesis: Study of RBE in Proton Therapy using New Generation Silicon Microdosimeters
- Supervisors: Linh Tran, Susanna Guatelli & Anatoly Rozenfeld
- Accredited course for entry into clinical medical physics training by the ACPSEM (Australia) & residency by CAMPEP, AAPM (USA)

University of Western Australia *Australia*

BSc (Science) *Feb 2011 – Jun 2014*

- Engineering Science – Mechanical
- Study abroad Sem 1, 2014: Tembusu College, National University of Singapore

Published Works

Peer-reviewed Journal Articles

J. Yap, A. Steinberg, H. Norman, K. Nesteruk & S. L. Sheehy. (under review). '*Toward Ultra-fast Treatments: Large Energy Acceptance Beam Delivery Systems and Opportunities for Proton Beam Therapy*' *(arXiv)*.

J. S. L. Yap, N. J. S. Bal, M. D. Brooke, C. Oancea, C. Granja, A. Kacperek, S. Jolly, F. Van den Heuvel, J. L. Parsons & C. P. Welsch. (2025). '*LET measurements and simulation modelling of the charged particle field for the Clatterbridge ocular proton therapy beamline*' J. Instrum., vol. 20, no. 10, P10008 (doi: 10.1088/1748-0221/20/10/P10008).

D. J. Butler, M. Barnes, M. R. McEwan, M. L.F. Lerch, S. L. Sheehy, Y.-W. E. Tan, I. M. Williams & **J. S.L. Yap** (2024). '*Dosimetry for FLASH and other non-standard radiotherapy sources*'. Radiat. Meas. pp. 107330 (doi: 10.1016/j.radmeas.2024.107330).

A. F. Steinberg, **J. S.L. Yap**, R. B. Appleby & S. L. Sheehy (2024). '*Design of a large energy acceptance beamline using Fixed Field Accelerator optics*'. Phys. Rev. Accel. Beams 27, pp. 07601-20 (doi: 10.1103/PhysRevAccelBeams.27.071601).

J. S.L. Yap, A. F. Steinberg, S. J. Clarke, H. X.Q. Norman, R. B. Appleby & S. L. Sheehy (2024). '*Progress toward TURBO: A Novel Beam Delivery System for Charged Particle Therapy*'. Journal of Physics: Conference Series, 14th International Particle Accelerator Conference, 2687, pp. 1-6 (doi: 10.1088/1742-6596/2687/9/092004).

A. F. Steinberg, **J. S.L. Yap**, H. X.Q. Norman, R. B. Appleby & S. L. Sheehy (2024). '*Characterising the Pelletron beam at the University of Melbourne*'. Nucl. Instrum. Methods Phys. Res. A., vol 1059, 169013, pp. 1-9 (doi: 10.1016/j.nima.2023.169013).

J. S.L. Yap, A. F. Steinberg, H. X.Q. Norman, R. B. Appleby & S. L. Sheehy (2023). '*TURBO: A Novel Beam Delivery System Enabling Rapid Depth Scanning for Charged Particle Therapy*'. Journal of Physics: Conference Series, 13th International Particle Accelerator Conference, 2420, pp. 1-6 (doi: 10.1088/1742-6596/2420/1/012094).

J. Yap, A. De Franco & S. Sheehy (2021). '*Future Developments in Charged Particle Therapy: Improving Beam Delivery for Efficiency and Efficacy*'. Front. Oncol., vol. 11, no. Dec, pp. 1–25 (doi: 10.3389/fonc.2021.780025).

J. S. L. Yap, N. J. S. Bal, A. Kacperek, J. Resta López & C. P. Welsch (2021). '*Medipix3 for dosimetry and real-time beam monitoring: first tests at a 60 MeV proton therapy facility*'. J. Instrum., vol. 16, no. 11, T11001, Nov, pp. 0-21 (doi: 10.1088/1748-0221/16/11/T11001).

J. Yap, J. Resta-López, A. Kacperek, R. Schnuerer, S. Jolly, S. Boogert & C. Welsch (2020). '*Beam characterisation studies of the 62 MeV proton therapy beamline at the Clatterbridge Cancer Centre*'. Physica Medica, vol. 77, Jan, pp. 108– 120 (doi: 10.1016/j.ejmp.2020.08.002).

R. Schnuerer, **J. Yap**, H. Zhang, T. Cybulski & C. Welsch et al. (2019). '*Development of the LHCb VELO Detector Modules into a Standalone, Non-Invasive Online Beam Monitor for Medical Accelerators*'. Instruments 2019, 3(1), 1, pp. 1-12 (doi: 10.3390/instruments3010001).

Fully-published Conference Proceedings

A. F. Steinberg, **J. S.L. Yap**, R. B. Appleby & S. L. Sheehy (2024). '*A Novel Large Energy Acceptance Beamline for Hadron Therapy*'. Conference Proceedings of the 14th International Particle Accelerator Conference (IPAC'23).

J. S.L. Yap, E. Higgins & S. L. Sheehy (2021). '*Preliminary Study of a Large Energy Acceptance FFA Beam Delivery System for Particle Therapy*'. Conference Proceedings of the 12th International Particle Accelerator Conference (IPAC'21).

J. S.L. Yap, M. D. Brooke, N. J.S. Bal, C. Oancea, C. Granja, A. Kacperek & C. P. Welsch (2019). '*Tracking and LET Measurements with the MiniPIX-TimePIX Detector for 60 MeV Clinical Protons*'. Conference Proceedings of the 12th International Particle Accelerator Conference (IPAC'21).

J. S.L. Yap, N. J.S. Bal, A. Kacperek, J. Resta-López, C. P. Welsch et al. (2019). '*Beam characterisation using Medipix3 and EBT3 film at the Clatterbridge Eye Proton Therapy Beamline*'. Conference Proceedings of the 10th International Particle Accelerator Conference (IPAC'19).

R. Schnuerer, **J. S.L. Yap**, H. Zhang, T. Cybulski & C. P. Welsch et al. (2019). '*Non-Invasive beam monitoring using LHCb VELO with 40 MeV protons*'. Conference Proceedings of the 10th International Particle Accelerator Conference (IPAC'19).

R. Schnuerer, **J. S.L. Yap**, H. Zhang, G.J. Haefeli, O. Girard & C. P. Welsch (2018). '*Implementation of a non-invasive online beam monitor at a 60 MeV proton therapy beamline*'. Conference Proceedings of the 9th International Particle Accelerator Conference (IPAC'18).

R. Schnuerer, H. Zhang, **J. S.L. Yap** & C. P. Welsch (2017). '*Non-invasive online beam monitor using LHCb VELO*'. Conference Proceedings of the 8th International Particle Accelerator Conference (IPAC'17).

Other Publications

'*Everyday Particle Accelerators*'. Feature article (in print). Double Helix Magazine (CSIRO), 1 - December 2021, pp. 10-11.

'*Accelerating Proton Beam Therapy*'. Feature article (in print). Materials World (IOM3), December 2019, pp. 26-29.

Presentations

Invited Talks

Feb 2025. '*Technology for Ultra Rapid Beam Operation (TURBO): Scaling down and speeding up particle therapy*'. Conference talk at MMND-ITRO 2025, Sydney, Australia.

Aug 2024. '*Proton Beam Therapy Technologies: Current status, developments and research at UoM*'. Seminar talk ACPSEM VIC/Tas Branch event, RMIT, Melbourne, Australia.

Aug 2024. '*Physics for Cancer Treatment: Particle Accelerator Technologies and Radiation Therapy*'. Lecture for Physics Gymnasium Annual Lecture Series, UniMelb, Melbourne, Australia.

June 2023. '*Improving delivery efficiency and efficacy in particle therapy: recent progress and future technological developments*'. Seminar talk for HEP summer series at The Centre for the Clinical Application of Particles (CCAP), Imperial College London, UK.

Aug 2021. '*Beam delivery: Limitations & future improvements for charged particle therapy*'. Seminar talk for MRFF/ACRF Image X/Ingham Institute group, Sydney, Australia (online).

Jan 2021. '*Beam characterisation and modelling for novel beam diagnostics development for particle therapy*'. Seminar talk for UWA Medical Physics/Radiation Oncology, Sir Charles Gairdner Hospital, Perth, Australia.

Dec 2020. '*Particle therapy activities in the Melbourne Accelerator Physics group*'. National Particle Therapy Symposium, Peter MacCallum Cancer Centre, Melbourne, Australia (online).

Oct 2020. '*Beam characterisation and modelling for novel beam diagnostics development for particle therapy*'. Accelerator Technology Forum (ATF), ANSTO, Australia (online).

Aug 2020. '*Beam characterisation and modelling for novel beam diagnostics development for particle therapy*'. Seminar talk for Ingham Institute Medical Physics, Sydney, Australia (online).

June 2020. '*My experience as a MSCA-funded PhD candidate in Europe*', EURAXESS webinar, AUS/NZ region (online).

Sept 2019. '*Monte Carlo modelling of the Clatterbridge Proton Therapy beamline for Beam Diagnostics integration*'. International Conference on Medical Accelerators, Seville, Spain.

Contributed Talks

J. Yap, A. Steinberg, H. Norman, R. Appleby & S. L. Sheehy (Nov 2024). '*Toward Ultra-fast, Compact, and Upright treatment delivery for Proton Therapy*'. Engineering and Physical Sciences in Medicine (EPSM 2024) & Australian Biomedical Engineering Conference, Melbourne, Australia.

J. S.L. Yap, A. F. Steinberg, H. X.Q. Norman, R. B. Appleby, K. P. Nesteruk & S. L. Sheehy (June 2024). '*Technology For Ultra Rapid Beam Operation (TURBO): Developing A Proof-of-Concept Demonstrator Enabling Rapid PBS Delivery For Particle Therapy*'. Particle Therapy Co-operative Conference (PTCOG62), Singapore.

J. Yap, A. Steinberg, H. Norman, R. Appleby & S. L. Sheehy (Oct 2022). '*Technology for Ultra Rapid Beam Operation (TURBO) – a new system to improve efficiency and efficacy for charged particle therapy*'. Engineering and Physical Sciences in Medicine (EPSM 2022), Adelaide, Australia.

J. S.L. Yap, A. F. Steinberg & S. L. Sheehy (June 2022). '*TURBO: A novel beam delivery system with fast energy switching for rapid depth scanning*'. Particle Therapy Co-operative Conference (PTCOG60), Miami, USA.

J. S.L. Yap & S. L. Sheehy (Sept 2021). '*Improvements in delivery and treatment for charged particle therapy with a large energy acceptance beam delivery system*'. International Workshop on Fixed Field alternating gradient Accelerators (FFA'21), Kyoto University, Japan (online).

J. Yap, M. Hentz, A. Kacperek, R. Schnuerer, S. Jolly & C.P. Welsch (Oct 2018). '*Monte Carlo modelling of the Clatterbridge Proton Therapy beam line*'. Engineering and Physical Sciences in Medicine (EPSM), Adelaide, Australia.

J. S.L. Yap, R. Schnuerer, H. Zhang, C. P. Welsch et al. (May 2018). '*Implementation of a Non-invasive Online Beam Monitor at a 60 MeV Proton therapy beamline*'. Particle Therapy Co-operative Conference (PTCOG57), Cincinnati, USA.

J. Yap (Dec 2018). '*Study of the Clatterbridge Eye Proton Therapy beamline*', OMA 3rd Topical Workshop on Medical Accelerator Design & Diagnostics, GSI, Germany.

J. Yap (Oct 2018). '*Halo dose correlation in a medical accelerator*'. 7th annual Cockcroft Institute Postgraduate Conference, Daresbury Lab, UK.

J. Yap (June 2018). '*Halo dose correlation in a medical accelerator*'. OMA 2nd Topical Workshop on Diagnostics for Beam and Patient Monitoring, CERN, France/Switzerland.

Poster Presentations

J. Yap, A. Steinberg, K. Nesteruk & S. Sheehy (June 2025). '*Design of a Degrader and Beam Shaping System for Rapid Beam Delivery*'. Particle Therapy Co-operative Conference (PTCOG63), Buenos Aires, Argentina.

J. S.L. Yap, A. F. Steinberg, A. Yeo, H. X.Q. Norman, R. B. Appleby & S. L. Sheehy (June 2023). '*Progress and developments with TURBO: A system enabling fast energy switching for rapid beam delivery*'. Particle Therapy Co-operative Conference (PTCOG61), Madrid, Spain.

J. S.L. Yap, A. F. Steinberg, S. J. Clarke, H. X.Q. Norman, R. B. Appleby & S. L. Sheehy (June 2023). '*Progress Toward TURBO: A Novel Beam Delivery System for Charged Particle Therapy*'. 14th International Particle Accelerator Conference (IPAC'23), Venice, Italy.

J. S.L. Yap, A. F. Steinberg, H. X.Q. Norman, R. B. Appleby & S. L. Sheehy (June 2022). '*TURBO: A Novel Beam Delivery System Enabling Rapid Depth Scanning for Charged Particle Therapy*'. 13th International Particle Accelerator Conference (IPAC'22), Bangkok, Thailand.

J. S.L. Yap, E. Higgins & S. L. Sheehy (May 2021). '*Preliminary Study of a Large Energy Acceptance FFA Beam Delivery System for Particle Therapy*'. 12th International Particle Accelerator Conference (IPAC'21), Campinas, Brazil (online).

J. S.L. Yap, M. D. Brooke, N. J.S. Bal, C. Oancea, C. Granja, A. Kacperek & C. Welsch (May 2019). '*Tracking and LET Measurements with the MiniPIX-TimePIX Detector for 60 MeV Clinical Protons*'. 12th International Particle Accelerator Conference (IPAC'21), Campinas, Brazil (online).

J. Yap, A. Kacperek, M. Brooke, S. Jolly & C. Welsch (June 2021). '*Development of a Monte Carlo simulation model of the Clatterbridge Cancer Centre 60 MeV ocular proton therapy beamline in TOPAS*'. Particle Therapy Co-operative Conference (PTCOG59), Taipei, Taiwan (online).

J. Yap, S. Jolly, S. Boogert, A. Kacperek, R. Schnuerer, J. Resta-López, C. Welsch et al. (June 2019). '*End to end simulations of the Clatterbridge Eye Proton Therapy Beamline*'. Particle Therapy Co-operative Conference (PTCOG58), Manchester, UK.

J. Yap, R. Schnuerer, M. Hentz, A. Kacperek, S. Jolly, S. Boogert, L. Nevay, J. Resta-López & C.P. Welsch (March 2019). '*Online Beam Monitor for Proton Therapy Beams*'. Low energy beam diagnostics workshop, Imperial College, London, UK.

J. Yap, M. Hentz, A. Kacperek, S. Jolly, R. Schnuerer, J. Resta-López & C.P. Welsch (Feb 2019). '*Simulation Study of the Clatterbridge Eye Proton Therapy Beamline*'. PPRIG Proton Physics Workshop 5, NPL, Teddington, UK.

J. Yap, M. Hentz, A. Kacperek, S. Jolly, R. Schnuerer, J. Resta-López & C.P. Welsch (June 2018). '*Simulation Study of the Clatterbridge Eye Proton Therapy Beamline*'. ENLIGHT meeting, University College London, London, UK.

Research Grants

2024–2029 **A compact beam delivery system enabling ultra-fast dose delivery for upright proton therapy**, National Institutes of Health R01 R37CA288343, NCI, US Government (Co-Investigator): *USD $2,398,154*

2021 **Early-stage experiments toward a novel particle therapy beam delivery system**, Laby Foundation, University of Melbourne (Co-Investigator): *$30,000*

Awards

2024 **Innovation and Future Impact Award**, Australasian College of Physical Scientists and Engineers in Medicine

2022 **Laby ECR Travelling Award**, School of Physics, University of Melbourne: *$5000*

2015 **IAEA-NIRS Heavy Ion Radiotherapy Workshop Course scholarship**, National Institutes for Quantum and Radiological Science and Technology (QST), Chiba, Japan

Supervision & Teaching

2025– **Primary supervisor**, J. Bellesini, PhD candidate, University of Melbourne

2025– **Co-supervisor**, S. Barg, PhD candidate, University of Melbourne

2022–2025 **Co-supervisor**, H. Norman, PhD candidate, University of Melbourne & University of Manchester (Dual-award Cookson Scholar)

2022–2024 **Co-supervisor**, A. Steinberg, PhD candidate, University of Melbourne & University of Manchester (Dual-award Cookson Scholar)

2025 **Supervisor**, G. Krawczyk, Undergrad Sem 2 Research Student, University of Melbourne

2025 **Co-supervisor**, L. Nicholson, Winter student, University of Melbourne (Laby Scholar)

2025 **Co-supervisor**, M. Showell, Winter student, University of Melbourne (Laby Scholar)

2025 **Co-supervisor**, R. Das, Undergrad Sem 1 Research Student, University of Melbourne

2024 **Supervisor**, E. Campbell, Undergrad Sem 2 Research Student, University of Melbourne

2024 **Supervisor**, R. Stewart, Winter student, University of Melbourne (Laby Research Scholar)

2023 **Supervisor**, S. J. Clarke, Summer student, University of Melbourne (AMGEN Scholar)

2021–2023 **MSc Advanced Seminars – Semester 1**, Co-Organiser

Professional Development & Engagement

Appointments

Sept 2025 – Present **Honorary Research Fellow**, Medical Accelerator Physics Group, School of Physics, University of Melbourne

Service

2024 – 2025 **Chair**, School of Physics (SoP) Early Career Academic Committee

2021 – 2025 **Postdoc Representative**, SoP Research & Research Training Committee

2022 – 2024	**School of Physics Representative**, Science Early Career Academic Network (SECAN) Committee; SECAN liaison with MDHS & FEIT Committees; LMS portfolio; Organising committee for Faculty of Science ECA End-of-Year event 2022 & 2023
2018 – 2019	**Accelerator Science Representative**, Postgraduate Research Staff-Student Liaison Committee

Outreach

STEM rep, Melbourne Girls in Physics Breakfast (20th May 2025), Melbourne, Australia.

Demonstrator. Girls in Physics Day (22nd July 2022), University of Melbourne, Australia.

Demonstrator. Symposium on Accelerators for Science and Society (28th June 2019), ACC Liverpool, United Kingdom.

Demonstrator. Particle Colliders - Accelerating Innovation (22nd March 2019), ACC Liverpool, United Kingdom.

Volunteer. Physics of Star Wars (11th Oct 2018), University of Liverpool, United Kingdom.

Volunteer. Marie Curie Day (7th Nov 2017), LMU, Munich, Germany.

Volunteer. Accelerator Experience Day (24th Jan 2017), Cockcroft Institute, United Kingdom.

Demonstrator. Science Jamboree (26th Nov 2016), University of Liverpool, United Kingdom.

Other Activities

Panellist, PTCOG ECR Careers in Academia Mentor Networking Lunch (4th June 2025), Buenos Aires, Argentina.

Seminar for Physics Student Society (6th May 2025), University of Melbourne, Australia.

Academic rep, Faculty of Science IWD GR Networking Event (11th March 2025), University of Melbourne, Australia.

Session chair, MMND-ITRO 2025 (Feb 2025), Sydney, Australia.

Moderator, Transition from Academia to Industry panel, Schools of Physics and Maths & Stats joint event (15 th Oct 2024), University of Melbourne, Australia.

Panellist, GCI Student Networking Event (4th Oct 2024), University of Melbourne, Australia.

Session chair, Particle Therapy Co-Operative Group Conference (June 2024), Singapore.

Panellist, AMGEN Scholars Program Symposium: Speed networking careers event (23rd Feb 2023), University of Melbourne, Australia.

Session chair, UniMelb Faculty of Science Early Career Academic Research Summit (March 2023), University of Melbourne, Australia.

Session chair, OMA International Conference on Medical Accelerators and Particle Therapy (Sept 2019), Seville, Spain.

Session chair, OMA School on Medical Accelerators and Particle Therapy (April 2019), MedAustron, Austria.

Peer Review

Ad hoc reviewer for: Medical Physics, Frontiers in Oncology, IEEE Transactions on Radiation and Plasma Medical Sciences, ASME Journal of Medical Devices, ACPSEM Physical and Engineering Sciences in Medicine Journal

Student scholarship selection committee – International Particle Accelerator Conference (multiple years)

Professional Memberships

Australasian College of Physical Scientists & Engineers in Medicine (ACPSEM)
Particle Therapy Working Group VIC representative; Quality Assurance Sub-group member.