DR JESSIE A. POSAR

PROFESSIONAL DETAILS

Postdoctoral Research Associate, University of Sydney

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EDUCATION

2022	**Doctor of Philosophy (Physics)**, University of Wollongong (Australia)
2017	**Bachelor of Science Advanced (Physics)**, Class 1 Honours, University of Wollongong (Australia)

TOP 5 AWARDS

2022	**Gold Recipient Winner: Graduate Student Award,** Materials Research Society (MRS) *Prestigious top international graduate award for a high level of excellence and distinction in materials research. Invitation and full funding to present at the MRS congress in Hawaii, US.*
2022	**inSTEM Award,** inSTEM initiative of the ARC Centres of Excellence *Full funding to attend the networking and career development conference for underrepresented groups in STEM in Brisbane, AUS.*
2022	**Best Early Career Researcher Oral Presentation,** Australasian Community for Advanced Organic Semiconductors (AUCAOS)
2021	**Scholar Gold Medal,** The Australian Institute of Nuclear Science and Engineering *Top Australian graduate for research excellence and impact in nuclear science*
2018-2021	**Post Graduate Research Award,** The Australian Institute of Nuclear Science and Engineering (AINSE) *Competitive scholarship for exceptional graduate students at member universities to support facility access, travel, and conferences*

CAREER HISTORY

Current (Since 2021) — **Bioelectronic Nanomaterials Experimental Group Leader – Faculty of Engineering, University of Sydney**

- Part of a team to establish a new lab facility for nanoscale biochemical fabrication and nano-characterization activities
- Experimental lead on the development of tunable nanostructured organic conductive surfaces as a mechanical cue for neuron growth and electrical connectivity

2017-2021 — **Polymer X-Ray Detectors for Medical Application, Experimental Group Leader – Centre for Medical Radiation Physics, University of Wollongong**

- Demonstrated the feasibility of organic semiconductors as low-cost radiation detectors in clinical environments (2 first author papers in the top 10% Radiology, Nuclear Medicine and Medical Imaging)

- Established key material design properties required for radiation design and optimization of organic radiation detectors (2 first author papers in top 5% material science)
- Formed an international collaboration network of experts in the field of novel materials for radiation detection including the University of Bologna (Italy), University of Surrey (UK), and University of Newcastle (Aus)

2018 **Printable and Flexible Polymer Photovoltaics, Visiting Research Fellow – Priority Centre for Organic Electronics, University of Newcastle**

- Established new design protocols to enable printable and flexible organic films for x-ray dosimeters in medical applications
- Invited lecture with the title 'Translation of organic semiconductors as a printable and flexible x-ray detector: Towards the future of wearable technology'
- Work formed part of a value proposition for establishing of a $12.2M AU biomedical printing hub in NSW, funded by the Modern Manufacturing Initiative.

2017 **Electronic Transport of Organic Conductors, Visiting Research Fellow – Department of Physics, University of Surrey**

- Designed and implemented a charge carrier mobility measurement system for organic semiconductors
- Invited lecture with the title 'Novel applications of organic semiconductors: Energy, space and medicine'

PUBLICATION OVERVIEW

Impact Statement: I am leading author on publications ranked in the top 5% in the field of Material Science (SJR) including *ACS Appl. Mater. Interfaces* (IF=10.383) and *Adv. Mater. Technol* (IF=8.856) and the top 10% in Radiology, Nuclear Medicine and Medical Imaging (SJR). As a result, I have been invited to write 2 topical reviews in my field and contribute to a book chapter with Springer Nature.

TOP CAREER PUBLICATIONS

Book Chapter

1. **Posar JA**, Liao C, Ho-Baillie A, Petasecca M, Griffith MJ. (2022). Solution Processable Metal Halide Perovskites for Printable and Flexible Ionizing Radiation Detectors. In: Nie W and Iniewski K (Eds.). Metal-Halide Perovskite Semiconductors. Springer, Cham. https://doi.org/10.1007/978-3-031-26892-2_8

Journal Articles

2. **Posar JA***, Large MJ*, Mozer AJ, Nattestad A, Alnaghy S, Carolan M, Sellin PJ, Davies J, Pastuovic Z, Lerch MLF, Guatelli S, Rosenfeld A, Griffith MJ, & Petasecca M. (2021). Flexible Polymer X-ray Detectors with Non-fullerene Acceptors for Enhanced Stability: Toward Printable Tissue Equivalent Devices for Medical Applications. ACS Applied Materials and Interfaces, 13(48), 57703–57712. https://doi.org/10.1021/acsami.1c16914 *equal first author
3. **Posar JA**, Davis J, Alnaghy S, Wilkinson D, Cottam S, Lee DM, Thompson KL, Holmes NP, Barr M, Fahy A, Nicolaidis NC, Louie F, Fraboni B, Sellin PJ, Lerch MLF, Rosenfeld AB, Petasecca M, Griffith MJ. (2021). Polymer Photodetectors for Printable, Flexible and Fully Tissue Equivalent X-ray Detection with Zero-Bias Operation and Ultrafast Temporal Responses. Adv Mater Technol, 6(9), 2001298. https://doi.org/10.1002/admt.202001298
4. **Posar JA**, Petasecca M, & Griffith MJ. (2021). A Review of Printable, Flexible and Tissue Equivalent Materials for Ionizing Radiation Detection. Flexible and Printed Electronics, 6(4), 043005. https://doi.org/10.1088/2058-8585/ac32aa

5. **Posar JA**, Large MJ, Alnaghy S, Paino JR, Butler DJ, Griffith MJ, Hood S, Lerch MLF, Rosenfeld AB, Sellin PJ, Guatelli S, & Petasecca M. (2021). Toward High Spatial Resolution Tissue-Equivalent Dosimetry for Microbeam Radiation Therapy Using Organic Semiconductors. Journal of Synchrotron Radiation, 28, 1444–1454. https://doi.org/10.1107/S1600577521006044
6. **Posar JA**, Davis J, Large MJ, Basiricò L, Ciavatti A, Fraboni B, Olivier D, Wilkinson D, Sellin PJ, Griffith MJ, Lerch MLF, Rosenfeld A & Petasecca M. 2020. Characterization of an Organic Semiconductor Diode for Dosimetry in Radiotherapy. Med Phys, 47, 3658–68. https://doi.org/10.1002/mp.14229
7. Griffith MJ, Cottam S, Stamenkovich J, **Posar JA**, Petasecca M. 2020. Printable Organic Semiconductors for Radiation Detection: From Fundamentals to Fabrication and Functionality. Front Phys, 8:22. https://doi.org/10.3389/fphy.2020.00022
8. **Posar JA**, Davis J, Brace O, Sellin P, Griffith MJ, Dhez O, Wilkinson D, Griffith MJ, Lerch MLF, Rosenfeld A & Petasecca M. 2020. Characterization of a plastic dosimeter based on organic semiconductor photodiodes and scintillator. Phys Imaging Radiat Oncol, 14:48–52. https://doi.org/10.1016/j.phro.2020.05.007
9. Sherwood CP, Crovador R, **Posar, JA**, Brichta N, Louie MPS., Dastoor PC, Brichta AM, Cairney JM, Holmes NP, Lim R, & Griffith MJ. 2023. Design Parameters and Human Biocompatibility Assessment Protocols for Organic Semiconducting Neural Interfaces: Towards a Printed Artificial Retina with Colour Vision. Adv Mater Interfaces, 2202229. https://doi.org/10.1002/admi.202202229

RESEARCH SUPPORT

I have been awarded $356k in competitive grants with ~half as lead CI to establish an independent research path.

2022	**Lead** – AINSE Early career Research Grant ($9k)
2022 & 2023	**Lead** – ANSTO Research Proposal and Australian Synchrotron ($100k)
2022	**Lead** – The University of Sydney Nano Institute ECR Support Fund ($2k)
2018, 2021, & 2023	**Co-proposer** – ANSTO Research Proposal and Australian Synchrotron ($233k)
2018	**Co-proposer –** University Global Partnership Network Research Collaboration Fund ($20k)
2018 till 2021	**Lead** – Australian Government Research Training Program ($64k)
2018 till 2021	**Lead** – AINSE Post Graduate Research Award ($21k)

CONFERENCE PRESENTATIONS

I have been invited to speak at major national/international conferences and events. Selected talks from the past 5 years are listed here:

- **2023** High Precision X-Ray Measurements (Frascati, Italy) – **Invited Talk**
- **2022** Australian Institute of Physics (AIP) Congress (Adelaide, Australia)
- **2022** Australasian Community for Advanced Organic Semiconductors Symposium (Tweed Heads, Australia)
- **2022** Materials Research Society (MRS) Spring Meeting (Honolulu, USA) – **Invited Talk**
- **2022** AINSE Annual General Meeting (Sydney, Australia) – **Invited Talk**
- **2020** European Society for Radiotherapy and Oncology (ESTRO) Conference (online)
- **2020** IEEE NSS-MIC Conference (online)
- **2020-2021** AINSE Annual Report selected feature in research highlights

- **2020** AINSE Symposium (online) – **Invited Talk**
- **2019** IEEE NSS-MIC Conference (Manchester, United Kingdom)
- **2019** ANSTO User Meeting (Sydney, Australia)

SUPERVISION AND TEACHING

- **2023 Master's Coursework Guest Lecture**, University of Sydney, Introduction to Biophotonics
- **2023 Interdisciplinary Research Project,** University of Sydney. Supervised three students on the project *"Superconducting Qubit Design Optimization for Quantum Computing"*
- **2022-present PhD Student,** co-supervisor, University of Wollongong
- *"Edgeless diode detectors for angular independent dosimetry in Radiotherapy"*
- **2021-2022 Research Assistant,** co-supervisor, University of Sydney.*"Printable Micron-Resolution Organic Photocapacitors for Neural Interfacing"*
- **2022-present HSC Science Extension Course Mentor,** University of Sydney. Advice and teaching resources for science extension HSC students and teachers.
- **2022 Interdisciplinary Research Project,** University of Sydney. Supervised three students on the project *"Investigating Gamma Radiation Damage to Perovskites"* receiving final mark >88%
- **2021-Present Group Mentor,** University of Sydney. Regular mentor sessions with PhD students

ACADEMIC GOVERNANCE AND LEADERSHIP

- **2023 Early-Mid Career Researcher Network Committee Member,** Engineering Department, University of Sydney
- **2022-2023 Equity, Diversity and Inclusion Committee Member,** Engineering Department, University of Sydney
- **2022 Woman in Leadership: Foundational Skills,** Centre for Continued Learning, University of Sydney. Funded by the Head of School.
- **2019-2021 Postgraduate Student Representative,** School of Physics Committee, University of Wollongong
- **2015 Extra-Criteria Recognition Program Administrative Staff,** University of Wollongong

MEDIA

- **2022** Daily Telegraph Future Sydney Bradfield Oration – Profile Piece "*Taming Radiation Therapy"*
- https://www.uow.edu.au/media/2022/uow-phd-graduate-receives-prestigious-gold-medal-from-nuclear-institute.php
- https://aucaos.org.au/2022/12/21/aucaos-2022-symposium/

REFERENCES

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