

**HOLLY EDWARDS**

MPhys (Hons)

Metallurgist/Materials Scientist

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Holly Edwards is a qualified Materials Scientist who leads the Material testing and analysis team at The Lab.

Holly has extensive expertise in analysis techniques and the use of various equipment ranging from LIBS to SEM. She joined Brookes Bell in 2022 and has quickly developed a reputation for excellence and integrity in her field.

Holly graduated in 2016 with a MPhys (Hons) degree in Physics and subsequently submitted her PhD thesis on photovoltaics in March 2022. During her time at university, she has worked on many collaborative research projects with other universities and industries, locally and internationally.

Prior to working for Brookes Bell, Holly ran the ultrahigh vacuum laboratory at the Stephenson Institute for Renewable Energy. There she optimised synthesis methods for thin films and crystals, performed analysis using a variety of materials science techniques, and also performed these analyses for external samples simultaneously.

Academic Qualifications

Condensed Matter Physics, PhD

Physics, MPhys (Hons)

Courses/Conferences Attended

X-ray Photoelectron Spectroscopy and Surface Analysis for Researchers in Industry Workshop, SCI.

11th European Kesterite Kesterite Workshop.

NanoEnergy – Aalto University, Finland. (presentation)

Invited talk – IIT New Delhi, India.

NanoEnergy – University of Liverpool. UK. (poster)

Research Publications

1. M. J. Smiles, J. M. Skelton, H. Shiel, L. A. H. Jones, J. E. N. Swallow, H. J. Edwards, P. A. E. Murgatroyd, P. K. Thakur, T.-L. Lee, V. R. Dhanak, T. D. Veal, "Ge 4s² lone pairs and band alignments in GeS and GeSe," *J. Mater. Chem. A*, vol. 9, no. 39, pp 22440-22452, 2021; <https://doi.org/10.1039/D1TA05955F>
2. P. Tiwary, N. Chakrabarty, H. J. Edwards, V. R. Dhanak, A. Kar, R. Mahapatra, A. Chakraborty, "Hydrothermally Grown Uniform Sized Nickel Hydroxide/Oxyhydroxide Hexagonal Nanoprisms Exhibiting Room Temperature Ethanol Sensing Properties," *Appl. Surf. Sci.*, vol. 570, p. 151090, 2021; <https://doi.org/10.1016/j.apsusc.2021.151090>
3. S. Biswas, A. D. Paul, P. Das, H. J. Edwards, I. Z. Mitrovic, V. R. Dhanak, R. Mahapatra, "Impact of AlO_y Interfacial Layer on Resistive Switching Performance of Flexible HfO_x/AlO_y ReRAMs," *IEEE Trans. Electron Devices*, pp. 1-7, 2021; DOI: 10.1109/TED.2021.3084554
4. R. Garza-Hernández, H. J. Edwards, J. T. Gibbon, M. R. Alfaro Cruz, V. R. Dhanak, F. S. Aguirre Tostado, "Tunable crystal structure of Cu₂SnS₃ thin films deposited by spray pyrolysis and its impact on the chemistry and electronic structure," *J. Alloys Compd.*, vol. 881, p. 160552, 2021; DOI: 10.1016/j.jallcom.2021.160552
5. A. D. Paul, S. Biswas, P. Das, H. J. Edwards, D. Dalal, S. Maji, V. R. Dhanak, A. Mondal, R. Mahapatra, "Improved resistive switching characteristic of Ag/Al:HfO_x/ITO/PET ReRAM for flexible electronics application," *Semicond. Sci. and Technol.*, vol. 36, no. 6, pp. 65006, 2021; DOI: 10.1088/1361-6641/abf662

6. C. Tong, H. J. Edwards, T. D. C. Hobson, O. S. Hutter, K. Durose, V. R. Dhanak, J. D. Major, K. P. McKenna, "Density Functional Theory and Experimental Determination of Band Gaps and Lattice Parameters in Kesterite $\text{Cu}_2\text{ZnSn}(\text{S}_x\text{Se}_{1-x})_4$," *J. Phys. Chem. Lett.*, vol. 11, no. 24, pp. 10463–10468, 2020; doi: 10.1021/acs.jpcclett.0c03205
7. A. D. Paul, S. Biswas, P. Das, H. J. Edwards, V. R. Dhanak, R. Mahapatra, "Effect of Aluminium Doping on Performance of HfO-Based Flexible Resistive Memory Devices," *IEEE Transactions on Electron Devices*, vol. 67, no. 10, pp. 4222-4227, 2020; doi: 10.1109/TED.2020.3015824
8. S. Campbell, Y. Qu, J. Gibbon, H. J. Edwards, V. R. Dhanak, D. Tiwari, V. Barrioz, N. S. Beattie, G. Zoppi, "Defect Limitations in $\text{Cu}_2\text{ZnSn}(\text{S},\text{Se})_4$ Solar Cells Utilizing a In_2S_3 Buffer Layer", *J. Appl. Phys.*, vol. 127, no. 205305, 2020; <https://doi.org/10.1063/5.0002372>
9. J. E. N. Swallow, B. A. D. Williamson, S. Sathasivam, M. Birkett, T. J. Featherstone, P. A. E. Murgatroyd, H. J. Edwards, Z. W. Lebens-Higgins, D. A. Duncan, M. Farnworth, P. Warren, N. Peng, T.-L. Lee, L. F. J. Piper, A. Regoutz, C. J. Carmalt, I. P. Parkin, V. R. Dhanak, D. O. Scanlon, T. D. Veal, "Resonant doping for high mobility transparent conductors: the case of Mo-doped In_2O_3 ," *Mater. Horiz.*, vol. 7, pp. 236-243, 2020; <https://doi.org/10.1039/C9MH01014A>
10. J. Y. Zhang, W. W. Li, R. L. Z. Hoye, J. L. MacManus-Driscoll, M. Buddle, O. Bierwagen, L. Wang, Y. Du, M. J. Wahila, L. F. J. Piper, T.-L. Lee, H. J. Edwards, V. R. Dhanak, K. H. L. Zhang, "Electronic and transport properties of Li-doped NiO epitaxial thin films", *J. Mater. Chem. C*, vol. 6, no. 9, pp. 2275-2282, 2018; <https://doi.org/10.1039/C7TC05331B>
11. Q. D. Gibson, M. S. Dyer, G. F. S. Whitehead, J. Alaria, M. Pitcher, H. J. Edwards, J. B. Claridge, M. Zanella, K. Dawson, T. D. Manning, V. R. Dhanak, M. J. Rosseinsky, "Bi $_4\text{O}_4\text{Cu}_{1.7}\text{Se}_{2.7}\text{Cl}_{0.3}$: Intergrowth of BiOCuSe and Bi $_2\text{O}_2\text{Se}$ Stabilized by the Addition of a Third Anion," *J. Am. Chem. Soc.*, vol. 139, no. 44, pp. 15568-15571, 2017; <https://doi.org/10.1021/jacs.7b06168>