PROFESSOR DAVID MCKENZIE

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Research interests

Member of The Applied and Plasma Physics research group. Research projects in these areas are a stimulating mix of fundamental physics and practical applications, in areas which include materials physics, plasma deposition and processing, thin film materials, vacuum glazing, renewable and sustainable energy and cross-disciplinary research in the areas of biointerfaces and interactions of biosystems for medicine.

Current research students

Project title	Research student
Making the basic unit of electronic brain on the basis of biological brain	Enyi GUO
Radiation dosimetry methods and analysis	Madelaine TYLER

Selected grants

2017

Vacuum insulated energy-efficient windows: creating sustainable cities; Bilek M, McKenzie D; Australian Research Council (ARC)/Linkage Projects (LP).

Diamond glass: an all-carbon technology for neural networks and biosensing; McKenzie D, McCulloch D, Partridge J; Australian Research Council (ARC)/Discovery Projects (DP).

Light and tough: using extreme conditions to synthesise new materials; McKenzie D, McCulloch D; Australian Research Council (ARC)/Discovery Projects (DP).

2015

Next-Generation Electronic and Magnetic Materials Characterisation Facility; McKenzie D; Australian Research Council (ARC)/Linkage Infrastructure, Equipment and Facilities (LIEF).

2014

Nanoparticle Drug Carriers for Externally Triggered and Targetted Chemotherapy; McKenzie D; University of Sydney - Sydney Catalyst Translational Cancer Research/Pilot and Seed Funding.

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Selected publications

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By type(#publications-by-type)
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Book Chapters	Bilek, M., Powles, R., McKenzie, D. (2007). Treatment of polymeric biomaterials by ion implantation. In Paul K. Chu; Xuanyong Liu (Eds.), *Biomaterials and Surface Modification*, (pp. 205-248). India: Research Signpost. McKenzie, D., Marks, N., Bilek, M. (2003). Structure of a-C through Simulation. In S Ravi P Silva (Eds.), *Properties of Amorphous Carbon*, (pp. 37-45). United Kingdom: Inspec the Institution of Electrical Engineers. Bilek, M., McKenzie, D., Oates, T., Pigott, J., Denniss, P., Vlcek, J. (2002). Deposition of nanoscale multilayered structures using filtered cathodic vacuum arc plasma beams. In Oks, Efim; Brown, Ian (Eds.), *Emerging Applications of Vacuum-Arc-Produced Plasma, Ion and Electron Beams*, (pp. 173). The Netherlands: Springer. Nicorovici, N., Asatryan, A., McPhedran, R., de Sterke, C., Robinson, P., McKenzie, D., Botten, L., Busch, K., Smith, G., Parker, A. (2001). Multipole methods for photonic crystal calculations. In Costas M. Soukoulis (Eds.), *Photonic Crystals and Light Localization in the 21st Century*, (pp. 527-534). United Kingdom: Springer.
Journals	Lim, W., McKenzie, D., Suaning, G. (2017). Corrections to Graham's Law of effusion for predicting leak rates through hermetic seals. *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 7(3), 379-386. [More Information](http://dx.doi.org/10.1109/TCPMT.2017.2647738) Neumann, P., Bilek, M., McKenzie, D. (2016). A centre-triggered magnesium fuelled cathodic arc thruster uses sublimation to deliver a record high specific impulse. *Applied Physics Letters*, 109(9), 1-4. [More Information] (http://dx.doi.org/10.1063/1.4962124) Bathgate, S., Ganesan, R., Bilek, M., McKenzie, D. (2016). A HiPIMS plasma source with a magnetic nozzle that accelerates ions: Application in a thruster. *European Physical Journal: Applied Physics*, 76(3), 1-9. [More Information] (http://dx.doi.org/10.1051/epjap/2016160164) Show 332 more
Conferences	Iziumov, R., Beliaev, A., Kondyurina, I., Shardakov, I., Kondyurin, A., Bilek, M., McKenzie, D. (2016). Experimental investigation of plasma-immersion ion implantation treatment for biocompatible polyurethane implants production. *3rd International Conference on Competitive Materials and Technology Processes (IC-CMTP 2014)*, Miskolc-Lillafured: Institute of Physics Publishing. [More Information](http://dx.doi.org/10.1088/1757-899X/123/1/012003) Beliaev, A., Svistkov, A., Iziumov, R., Osorgina, I., Kondyurin, A., Bilek, M., McKenzie, D. (2016). Modelling of the mechanical behavior of a polyurethane finger interphalangeal joint endoprosthesis after surface modification by ion implantation. *3rd International Conference on Competitive Materials and Technology Processes (IC-CMTP 2014)*, Miskolc-Lillafured: Institute of Physics Publishing. [More Information](http://dx.doi.org/10.1088/1757-899X/123/1/012001) McKenzie, D., Bilek, M., Tran, C., Kosobrodova, E., Kondyurin, A., Wakelin, E. (2016). Plasma surface functionalisation for bio applications. *13th Asia-Pacific Conference on Plasma Science and Technology (APCPST 2016)*, Shanghai, China: IOP Publishing. Show 18 more
Patents	Bilek, M., McKenzie, D., Nosworthy, N., Kondyurin, A. (2013). Activated Polymers Binding Biological Molecules (Australia). *Patent No. 2007225021*. McKenzie, D., Fleming, S., Elsey, J., Law, S., Suchowerska, N., Lambert, J. (2013). Fibre Optic Dosimeter [hollow core]. *Patent No. 2007209775, 8344335*. McKenzie, D., Fleming, S., Elsey, J., Law, S., Suchowerska, N., Lambert, J. (2012). Fibre Optic Dosimeter [calibration signal]. *Patent No. 2009245866, 7663123, 8119979*.

Magazine / Newspaper Articles	Lu, W., McKenzie, D., Dunstan, C., Zreiqat, H., Bilek, M. (2012). Plasma Immersion Ion Implantation Treatment of Poly-ether Ether Ketone for the Immobilization of Biomolecules on Surfaces (ID: 836). *International Forum of Biomedical Materials: Nanobiomaterials for Tissue Regeneration*.

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