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Dr Carl Anthony BSc, PhD, CPhys, MIET, MInstP

Lecturer
Undergraduate Admissions Tutor

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About

Carl Anthony is a Lecturer within the Micro-engineering and Nano-technology Research Group situated in the School of Mechanical Engineering. He is also the Undergraduate Admissions Tutor for the School of Mechanical Engineering.

Carl has published 40 research papers, 27 in scientific journals and is co-author on 4 patents.

He has received first grant funding from EPSRC to investigate energy harvesting technology for powering in wheel tyre pressure sensors.

His research focus is Microsystems technologies and applications. With a focus on microsensors and the energy harvesting technologies required to power wireless microsensors.

Qualifications

- PhD in Electrical and Electronic Engineering, Newcastle University, 2006
- BSc(Hons) in Physics with Optoelectronics, University of Surrey, 1993

Biography

Carl Anthony received the B.Sc. degree in Physics with Optoelectronics from the University of Surrey in 1993 and the Ph.D. degree in Electronic Engineering from Newcastle University in 2006. He has over 17 years experience of scientific research and from 1993 to 2005 worked at the QinetiQ Malvern technology centre. Where his research focussed on the reliability of high temperature and high power electronic devices, uncooled thermal imaging technology and Microsystems.

Immediately prior to joining the University of Birmingham he was a CCD device development engineer at e2v technologies.

Carl joined the University of Birmingham in 2006 and initially worked as a research fellow investigating the effect of the Casimir force on Microsystems and developing non-linear coupled resonator arrays.

He is currently a lecturer in the MicroEngineering group in the School of Mechanical Engineering at the University of Birmingham. His research interests are in the field of Microsystems engineering; focused on coupled/nonlinear resonator systems, autonomous oscillators, energy harvesting for mobile/remote sensors, bio-MEMS tactile sensors and focused ion beam microfabrication techniques.

He is a member of the Institute of Physics and the Institute of Engineering Technology.

Teaching

Teaching Programmes

- Mechanical Engineering BEng
- Mechanical Engineering MEng
- Mechanical Engineering (Automotive) BEng
- Mechanical Engineering (Automotive) MEng
- Mechanical and Materials Engineering BEng
- Mechanical and Materials Engineering MEng
- Engineering Management MSc/Diploma/Certificate
- Operations Management MSc/Diploma/Certificate
- Project Management MSc/Diploma/Certificate

Postgraduate supervision

Carl is interested in supervising doctoral research students in the following areas:

- Coupled/non-linear microresonators
- Micro Energy harvesters
- Micro-vacuum systems

- Microsensors

If you are interested in studying any of these subject areas please contact Carl on the contact details above, or for any general doctoral research enquiries, please email: **dr@contacts.bham.ac.uk (mailto:dr@contacts.bham.ac.uk)** or call +44(0)121 414 5005
For a full list of available Doctoral Research opportunities, please visit our **Doctoral Research programme listings (http://www.bham.findaphd.com/?es=y&apl=y&aplt=&show)** .

Research

Research Themes
Microsystems engineering, Micro-Sensor arrays, Energy Harvesting, Focused Ion Beam microfabrication techniques.

Microsensors
The main emphasis of his work is in the field of resonant microsensors. This work has focused on the development of non-linear micro-resonator arrays to study the emergent collective behaviour predicted to occur in large coupled arrays. He is currently investigating the use of autonomous micro-impact oscillators to create large self driven 2D-coupled arrays. This resonant sensor focus has developed from his research at QinetiQ where he was part of a team developing an infrared thermal detector that utilised a temperature sensitive micro-resonator as the detection element.

He is also active in the area of bio-MEMS tactile sensors. He is part of a European consortium that are developing tactile sensors based on the integration of living cells with microsystems to measure the response of the cells to external stimuli.

Energy Harvesting
He is a member of the Energy Harvesting network and has a research interest in the powering of wireless remote sensors. In 2010 won an EPSRC first grant to investigate the development of a novel battery-less clockwork energy harvesting solution for powering in-wheel tyre pressure sensors.

Focused Ion Beam Microfabrication
He has also been involved over the last 4 years in the use of Focused Ion Beam as a tool for microfabrication. He is currently supervising a PhD student to investigate the effect of damage created by the ion bombardment of the sample on the dynamic properties of micro-resonators.

Publications

- Anthony, C.J., Torricelli, G, Prewett, P.D., Cheneler, D., Binns, C, Sabouri, A, (2011), Effect of focused ion beam milling on microcantilever loss, accepted for publication in Journal of MicroMechanics and MicroEngineering.
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- A. Mohammadkhani, M. Malboubi, C. Anthony, and K. Jiang, (2011), Characterization of Surface Properties of Ordered Nanostructures Using SEM Stereoscopic Technique, accepted for publication in MicroElectronic Engineering
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- Chitsaz Charandabi S, Prewett P D, Hamlett C A, Anthony C J, Preece J, (2011), Torsional Micro Paddle Resonator for Rapid Detection of Bio-warfare agents, accepted for publication in MicroElectronic Engineering
- Choubey, B., Anthony, C., Saad, N.H., Ward, M., Turnbull, R. and Collins, S. (2010) Characterization of coupled micro/nanoresonators using inverse eigenvalue analysis. Applied Physics Letters, 97 (13). p. 133114.
- C. Anthony, R. Turnbull, X. Wei, M. Ward, S.Collins, (2010), Fabrication and quality factor control of a microelectromechanical system resonator with linear differential drive, IET Sci. Meas. Technol., Vol. 4, Iss. 4, pp. 206–213
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- Anthony, CJ; Uren, MJ, (1999), Effect of post oxidation processing on dry oxides on N-type 4H-SiC, MICROELECTRONIC ENGINEERING, 48 (1-4): 249-252
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