Professor Stephen Sweeney

Professor of Physics

Department of Physics Advanced Technology Institute Photonics and Quantum Sciences Group

University of Surrey, UK

Tel.: +44 (0)1483 689406

Email: s.sweeney@surrey.ac.uk

Professor Stephen Sweeney obtained a BSc in Applied Physics and Qualified Teacher Status (QTS) from the University of Bath and a PhD in Semiconductor Laser Physics from the University of Surrey. Following his PhD and postdoctoral positions at Surrey, he joined Marconi Optical Components as a Scientist, becoming Lead Scientist of the Laser and Amplifier Technology group. In 2002, he returned to Surrey as a Lecturer, promoted to Chair in Physics in 2010. He led the photonics group based in the Advanced Technology Institute from 2010-2015 and was Head of the Department of Physics from 2015-2018. Working closely with industry, his research interests focus on developing new semiconductor systems for use in photonic devices such as lasers and photovoltaics and in the development of new photonic systems for use in communications, lighting, energy, biosciences, health and the emerging field of space-based photonics. His work has led to a large number of published and edited journal papers, book chapters and patents. In 2009 he was awarded a prestigious EPSRC Leadership Fellowship allowing him to focus on developing near- and mid-infrared laser technologies for applications in high efficiency optical communications, sensing and photonic integration.

In addition to his role at Surrey, he is the Chief Technology Officer for UK photonics start-up Zinir Ltd, he sits on the Editorial Boards of IEEE Journal of Quantum Electronics and Journal of Materials Science: Materials in Electronics, has guest edited IET Optoelectronics, IEEE Journal of Selected Topics in Quantum Electronics and IoP Semiconductor Science and Technology. He is a member of the EPSRC III-V National Centre Steering Committee, the EPSRC College and the Institute of Physics Semiconductor Physics committee. He serves as an expert international advisor for the EU and several national funding agencies such as the Department of Energy (USA), National Science Foundation (USA), Singapore Research Agency, Enterprise Ireland, Leibnitz Foundation amongst others. He sits on the committees for a number of international conferences and has chaired several conferences in semiconductors and photonics. In 2015 he was President of the Physics and Astronomy section of the British Science Association.

Stephen is passionate about science and the role it plays in the health and wealth of people. He enjoys engaging with people of all ages and regularly gives talks at schools,

interviews for the national press and is an advocate for UK science and technology globally.

Selected Publications:

1. Bushell Z, Florescu M, Sweeney S (2017) High-Q photonic crystal cavities in all-semiconductor photonic crystal heterostructures, Physical Review B95 (23) 235303 American Physical Society
2. Marko I, Sweeney S (2017) Progress towards III-V-Bismide Alloys for Near- and Mid-Infrared Laser Diodes, IEEE Journal of Selected Topics in Quantum Electronics 23 (6) 1501512 Institute of Electrical and Electronics Engineers (IEEE)
3. Broderick C, Jin S, Marko I, Hild K, Ludewig P, Bushell Z, Stolz W, Rorison J, O?Reilly E, Volz K, Sweeney S (2017) GaAs1?xBix/GaNyAs1?y type-II quantum wells: novel strain-balanced heterostructures for GaAs-based near- and mid-infrared photonics, Scientific Reports 7 46371 Nature Publishing Group
4. Eales Timothy, Marko Igor, Ikyo BA, Adams Alfred, Arafin S, Sprengel S, Amann M-C, Sweeney Stephen (2017) Wavelength dependence of efficiency limiting mechanisms in Type-I Mid-infrared GaInAsSb/GaSb lasers, IEEE Journal of Selected Topics in Quantum Electronics 23 (6) IEEE
5. Bonmati-Carrion MA, Hild K, Isherwood C, Sweeney SJ, Revell VL, Skene DJ, Rol MA, Madrid JA (2016) Relationship between Human Pupillary Light Reflex and Circadian System Status, PLoS One 11 (9) e0162476 Public Library of Science (PLoS)
6. Bushell Z, Florescu M, Sweeney SJ (2016) High-Q photonic crystal cavities in all-semiconductor heterostructures, University of Surrey
7. Marko I, Sweeney S, Hild K (2016) Temperature stable mid-infrared GaInAsSb/GaSb Vertical Cavity Surface Emitting Lasers (VCSELs), Scientific Reports 6 19595 Nature Publishing Group
8. Marko I, Broderick CA, Jin S, Ludewig P, Stolz W, Volz K, Rorison JM, O?Reilly EP, Sweeney SJ (2016) Optical gain in GaAsBi/GaAs quantum well diode lasers, Scientific Reports 6 Nature Publishing Group
9. Maspero R, Sweeney S, Florescu M (2016) Unfolding the band structure of GaAsBi, Journal of Physics: Condensed Matter 29 (7) 075001 Institute of Physics
10. Prins AD, Lewis MK, Bushell ZL, Sweeney SJ, Liu S, Zhang YH (2015) Evidence for a defect level above the conduction band edge of InAs/InAsSb type-II superlattices for applications in efficient infrared photodetectors, Applied Physics Letters 106 (17)
11. Sweeney S, Jha A (2015) Preface, Journal of Physics: Conference Series 619 (1)
12. O'Reilly EP, Sweeney SJ, Wang S, Zide JMO (2015) Dilute bismides and related alloys Preface, SEMICONDUCTOR SCIENCE AND TECHNOLOGY30 (9) ARTN 090301 IOP PUBLISHING LTD
13. Thomas T, Mellor A, Hylton NP, Fuehrer M, Alonso-Alvarez D, Braun A, Ekins-Daukes NJ, David JPR, Sweeney SJ (2015) Requirements for a GaAsBi 1eV sub-cell

in a GaAs-based multi-junction solar cell, SEMICONDUCTOR SCIENCE AND TECHNOLOGY 30 (9) ARTN 094010 IOP PUBLISHING LTD
14. Marko IP, Jin SR, Hild K, Batool Z, Bushell ZL, Ludewig P, Stolz W, Volz K, Butkute R, Pacebutas V, Geizutis A, Krotkus A, Sweeney SJ (2015)Properties of hybrid MOVPE/MBE grown GaAsBi/GaAs based near-infrared emitting quantum well lasers, SEMICONDUCTOR SCIENCE AND TECHNOLOGY 30 (9) ARTN 094008 IOP PUBLISHING LTD
15. Jha A, Sweeney SJ (2015) Optical, optoelectronic and photonic materials and applications, Semiconductor Science and Technology 30 (4)
16. Wache R, Florescu M, Sweeney SJ, Clowes SK (2015) Selectively reflective transparent sheets, ACTIVE PHOTONIC MATERIALS VII 9546 SPIE-INT SOC OPTICAL ENGINEERING
17. Chai GMT, Broderick CA, O'Reilly EP, Othaman Z, Jin SR, Petropoulos JP, Zhong Y, Dongmo PB, Zide JMO, Sweeney SJ, Hosea TJC (2015)Experimental and modelling study of InGaBiAs/InP alloys with up to 5.8% Bi, and with Delta(so) > E-g, SEMICONDUCTOR SCIENCE AND TECHNOLOGY 30 (9) ARTN 094015 IOP PUBLISHING LTD
18. Marko IP, Sweeney SJ (2015) Optical and electronic processes in semiconductor materials for device applications, Springer Series in Materials Science 203 pp. 253-297
19. Simmons RA, Jin SR, Sweeney SJ, Clowes SK (2015) Enhancement of Rashba interaction in GaAs/AlGaAs quantum wells due to the incorporation of bismuth, APPLIED PHYSICS LETTERS 107 (14) ARTN 142401 AMER INST PHYSICS
20. Marko I, Read G, Hossain N, Sweeney S (2015) Physical Properties and Characteristics of III-V Lasers on Silicon, IEEE Journal of Selected Topics in Quantum Electronics 21 (6) 1502208 IEEE
21. Adams A, Marko I, Mukherjee J, Stolojan V, Sweeney S, Gocalinska A, Pelucchi E, Thomas K, Corbett B (2015) Semiconductor Quantum Well Lasers With a Temperature-Insensitive Threshold Current, IEEE Journal of Selected Topics in Quantum Electronics 21 (6) 150080 pp. ?-? IEEE