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Education and Training

M.I.T.	Materials Science and Engineering	B.S., 1985
Cornell University	Materials Science and Engineering	M.S., 1987
Cornell University	Materials Science and Engineering	Ph.D, 1988

Research and Professional Experience

Current Position: MIT	Merton C. Flemings-SMA Chair Professor of Materials Engineering	2003-present
MIT SMART (Singapore-MIT Alliance for Research and Technology, MIT's Research Center in Singapore), Low Energy Electronic Systems (http://www.circuit-innovation.org)	Lead Principal Investigator	2012-present
Nanyang Technological University Singapore EEE	Visiting Professor	2014-present
Cornell University Johnson School of Management	Visiting Professor	2006-2014
Massachusetts Institute of Technology, Dept. of Materials Science and Engineering	Professor	2000-present
Massachusetts Institute of Technology, Dept. of Materials Science and Engineering	Associate Professor	1994-2000
AT&T Bell Laboratories	Research Scientist	1988-1994

Areas of Research Experience and Expertise:

Semiconductor Materials, Processes, and Devices; III-V Semiconductors (GaAs, InP, GaN, etc.); IV Semiconductors (Si, Ge, Sn, C); Heteroepitaxy; III-V/Si heteroepitaxy; defects in lattice-mismatched films; III-V devices (LEDs, HEMTs, etc); IV devices (detectors, MOSFETs, etc); solar cell devices; integrated circuits; water purification, materials and processes; innovation processes; commercialization and entrepreneurship

Expert Witness/Legal Technical Consultant Experience:

Time Frame: June 2013 – December 2016

Firm: Kramer Levins (2013-2014), Finnegan (2014-mid 2015), Vasquez Benisek & Lindgren (mid 2015-December 2015) NOTE: each firm retained me as the same case approached trial over three years
Client: Initial: Seoul Semiconductor; Final: Everlight Electronics Co., LTD et al
Adverse: Boston University
Venue: District Court of Massachusetts - Boston
Role as Expert Witness : trial testimony, deposition, expert reports, declarations

Time Frame: July 2015 – 2016
Firm: Steptoe and Johnson
Client: Raytheon
Adverse: Sony
Venue: Patent Trial and Appeal Board (IPR)
Role as Expert Witness : deposition (2), expert reports, declarations (2)

Time Frame: September 2016 – July 2017
Firm: Covington and Burling
Client: Samsung
Adverse: Lexington
Venue:
Role as Expert Witness : expert reports

Technology Transition and Company Formation:

Co-Founder and Director, New Silicon Pte. Ltd. (2016-present): a fabless integrated circuit company with proprietary out-sourced fabrication technology based on III-V devices incorporated into silicon manufacturing processes

Co-Founder and Chairman, AmberWave Systems Corporation (1998-2004): Invented, commercialized, and properly anticipated introduction of strained silicon technology by silicon CMOS industry. Pioneered AmberWave's internal IP group and process for creating IP-base for licensing

Founder and LLC Member-Manager, Paradigm Research LLC (2005-present): Implementation of profitable global out-sourced research model to exploit disequilibrium in current technology supply chain; developed first III-V-Si CMOS IC in partnership with Raytheon

Co-Founder and LLC Member-Manager, 4Power LLC (2005-present): A disruptive business model for high-end solar cells, based on a novel III-V/Si technology which allows for unprecedented efficiency and low weight at low cost

Co-Founder and Executive Director, Innovation Interface (2008-2014): a novel corporate-university interface for innovation production and learning

Synergistic Activities and Awards (Highlights)

*2016 Cornell Distinguished Alumni Award, Department of Materials Science and Engineering
*2011 IEEE Andrew S. Grove Award (outstanding contributions to solid-state devices and technology)**:** specifically "For seminal contributions to the demonstration of Si/Ge lattice mismatch strain engineering for enhanced carrier transport properties in MOSFET devices"
*IEEE 2004 EDS George Smith Award
*Member, MIT President's Committee on "The Future if MIT Education"

*Member, MIT President’s Committee on “The Innovation Initiative”

*Member, International Advisory Board, Cantillon Centre (Innovation and Entrepreneurship), University College Dublin, Ireland, 2016

*Founding Faculty Team creating MIT’s Innovation and Entrepreneurship Minor (2016)
Launched first core class “Venture Engineering” for the new MIT I&E minor. Course is bridging the gap between MIT’s Sloan School of Management and MIT’s Engineering School to deliver broad problem solving skills (including forming new organizations) to engineers

*Member of start-up team that developed highly successful Advanced Materials program in the Singapore-MIT Alliance, 1998-2009

*Founding Faculty Team creating MIT’s Innovation and Entrepreneurship Minor (2016)
Launched first core class “Venture Engineering” for the new MIT I&E minor. Course is bridging the gap between MIT’s Sloan School of Management and MIT’s Engineering School to deliver broad problem solving skills (including forming new organizations) to engineers

*Innovation and Commercialization Hybrid Class, NTU, Singapore (2014 and 2015)Using a more advanced online platform based on the previous online edX and MIT classes, we taught NTU undergraduate students through a hybrid class structure (online course content, professor mentorship of students on practicing innovation). Demand from more than 150 students in second year (class size limited to 50).

*Created undergraduate Innovation and Commercialization Class, 3.086The first “flipped classroom” course offered in spring 2013 in DMSE. Also the first undergraduate version of 3.207 (see below)

*MITx/edX 3.086 Innovation and Commercialization
First innovation class on MITx to be launched in fall of 2013. Recognized as a factor which can aid US innovation and economic growth by the White House, Executive Branch, US Government

*Masters of Engineering Degree, DMSE MIT.Interdisciplinary engineering degree, adding emphasis on non-technical aspects of technology evolution and development; also became dual-degree program in Singapore- MIT Alliance 2

*Created 3.207 Technology Development and Evaluation.Leads MIT students and Singaporean students located in Singapore (real-time distance education technology) through the analysis of technology, potential applications, intellectual property, and business models for embryonic technology

*Member of start-up team that developed highly successful Advanced Materials program in the Singapore-MIT Alliance

*Robert Lansing Hardy Medal (promising young scientist), TMS, 1994

Books

E.A. Fitzgerald, A. Wankerl, C. Schramm, *Inside Real Innovation* (World Scientific, Singapore), 2011. (three printings, under contract for 2nd edition)

Publications and Patents

More than 400 published technical articles
More than 100 patents (domestic and international) issued
749 publications and patents in Google Scholar

More than 25,000 citations
Hindex=82
https://scholar.google.com/citations?user=YsZ6EjkAAAAJ&hl=en

	#Citation	Year
Spectrum Splitting Micro-Concentrator Assembly for Laterally-arrayed Multi-Junction Photovoltaic Module D Li, RT Wen, RD Shah, X Zhao, H Zhang, E Fitzgerald, DJ Perreault, ... CLEO: Applications and Technology, AW3O. 3		2018
Low-Threshold Lasing in Strained Germanium under Optical Pumping D Nam, S Bao, D Kim, C Onwukaeme, S Gupta, K Saraswat, KH Lee, ... CLEO: Science and Innovations, STh4I. 6		2018
Luminescence of III-IV-V thin film alloys grown by metalorganic chemical vapor deposition R Jia, T Zhu, V Bulović, EA Fitzgerald Journal of Applied Physics 123 (17), 175101		2018
GaAsP/InGaP HBTs grown epitaxially on Si substrates: Effect of dislocation density on DC current gain C Heidelberger, EA Fitzgerald Journal of Applied Physics 123 (16), 161532		2018
Curvature evolution of 200 mm diameter GaN-on-insulator wafer fabricated through metalorganic chemical vapor deposition and bonding L Zhang, KH Lee, A Kadir, Y Wang, KE Lee, CS Tan, SJ Chua, ... Japanese Journal of Applied Physics 57 (5), 051002		2018
High-performance AlGaInP light-emitting diodes integrated on silicon through a superior quality germanium-on-insulator Y Wang, B Wang, WA Sasangka, S Bao, Y Zhang, HV Demir, J Michel, ... Photonics Research 6 (4), 290-295		2018
A Fully Integrated Class-J GaN MMIC Power Amplifier for 5-GHz WLAN 802.11 ax Application B Liu, M Mao, CC Boon, P Choi, D Khanna, EA Fitzgerald IEEE Microwave and Wireless Components Letters		2018
A Highly Efficient Fully Integrated GaN Power Amplifier for 5-GHz WLAN 802.11 ac Application B Liu, M Mao, D Khanna, P Choi, CC Boon, EA Fitzgerald IEEE Microwave and Wireless Components Letters 28 (5), 437		2018
Suppression of interfacial voids formation during silane (SiH_4)-based silicon oxide bonding with a thin silicon nitride capping layer KH Lee, S Bao, Y Wang, EA Fitzgerald, C Seng Tan Journal of Applied Physics 123 (1), 015302	1	2018
III-V/Si dual junction solar cell at scale: Manufacturing cost estimates for step-cell based technology S Abdul Hadi, EA Fitzgerald, S Griffiths, A Nayfeh Journal of Renewable and Sustainable Energy 10 (1), 015905		2018
A Novel 2.6–6.4 GHz Highly Integrated Broadband GaN Power Amplifier	1	2018

B Liu, M Mao, D Khanna, CC Boon, P Choi, EA Fitzgerald
IEEE Microwave and Wireless Components Letters 28 (1), 37-39

Monolithic integration of Si-CMOS and III-V-on-Si through direct wafer bonding process 2017
KH Lee, Y Wang, B Wang, L Zhang, WA Sasangka, SC Goh, S Bao, ...
IEEE Journal of the Electron Devices Society

High mobility In 0.30 Ga 0.70 As MOSHEMTs on low threading dislocation density 200 mm Si substrates: A technology enabler towards heterogeneous integration of... 2017
S Yadav, A Kumar, XS Nguyen, KH Lee, Z Liu, W Xing, S Masudy-Panah, ...
Electron Devices Meeting (IEDM), 2017 IEEE International, 17.4. 1-17.4. 4

Sub-10 nm diameter InGaAs vertical nanowire MOSFETs 1 2017
X Zhao, C Heidelberger, EA Fitzgerald, W Lu, A Vardi, JA del Alamo
Electron Devices Meeting (IEDM), 2017 IEEE International, 17.2. 1-17.2. 4

Low-threshold optically pumped lasing in highly strained germanium nanowires 4 2017
S Bao, D Kim, C Onwukaeme, S Gupta, K Saraswat, KH Lee, Y Kim, D Min, ...
Nature communications 8 (1), 1845

Preventing phase separation in MOCVD-grown InAlAs compositionally graded buffer on silicon substrate using InGaAs interlayers 1 2017
D Kohen, XS Nguyen, RI Made, C Heidelberger, KH Lee, KEK Lee, ...
Journal of Crystal Growth 478, 64-70

Control wafer bow of InGaP on 200 mm Si by strain engineering 2017
B Wang, S Bao, RI Made, KH Lee, C Wang, KEK Lee, EA Fitzgerald, ...
Semiconductor Science and Technology 32 (12), 125013

MOCVD Growth of High Quality InGaAs HEMT Layers on Large Scale Si Wafers for Heterogeneous Integration With Si CMOS 2017
XS Nguyen, S Yadav, KH Lee, D Kohen, A Kumar, RI Made, KEK Lee, ...
IEEE Transactions on Semiconductor Manufacturing 30 (4), 456-461

Hetero-epitaxy of high quality germanium film on silicon substrate for optoelectronic integrated circuit applications 2 2017
KH Lee, S Bao, Y Lin, W Li, P Anantha, L Zhang, Y Wang, J Michel, ...
Journal of Materials Research 32 (21), 4025-4040

GaN device-circuit interaction on RF linear power amplifier designed using the MVSG compact model 2017
P Choi, U Radhakrishna, D Antoniadis, EA Fitzgerald
Compound Semiconductor Integrated Circuit Symposium (CSICS), 2017 IEEE, 1-4

Large spontaneous emission rate enhancement in a nanoscale III-V LED coupled to an optical antenna 2017
SA Fortuna, C Heidelberger, N Andrade, K Han, EA Fitzgerald, ...
Energy Efficient Electronic Systems & Steep Transistors Workshop (E3S), 2017 …

Integration of Si-CMOS and III-V materials through multi-wafer stacking 2017
KH Lee, L Zhang, B Wang, SC Goh, S Bao, Y Wang, WA Sasangka, ...

SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S …		
Unifying first-principles theoretical predictions and experimental measurements of size effects in thermal transport in SiGe alloys S Huberman, V Chiloyan, RA Duncan, L Zeng, R Jia, AA Maznev, ... Physical Review Materials 1 (5), 054601	1	2017
Method of manufacturing a germanium-on-insulator substrate KH Lee, CS Tan, YH Tan, GY Chong, EA Fitzgerald, S Bao US Patent App. 15/309,989		2017
Atomistic Approach for Modeling the Wafer Curvature for Pseudo-Morphic and Non-Pseudo-Morphic Epitaxial Multilayer Structures A Kadir, S Somasundaram, KE Lee, SJ Chua, EA Fitzgerald Meeting Abstracts, 999-999		2017
Low-threshold optically pumped lasing in highly strained Ge nanowires S Bao, D Kim, C Onwukaeme, S Gupta, K Saraswat, KH Lee, Y Kim, D Min, ... arXiv preprint arXiv:1708.04568		2017
Method of manufacturing a substrate KH Lee, CS Tan, EA Fitzgerald, EKK Lee US Patent App. 15/324,451		2017
Methods for Forming Semiconductor Device Structures AJ Lochtefeld, TA Langdo, R Hammond, MT Currie, EA Fitzgerald US Patent App. 15/452,995	1	2017
Thermal conductivity of GaAs/Ge nanostructures R Jia, L Zeng, G Chen, EA Fitzgerald Applied Physics Letters 110 (22), 222105	2	2017
Integration of 200 mm Si-CMOS and III-V materials through wafer bonding KH Lee, S Bao, KEK Lee, E Fitzgerald, CS Tan Low Temperature Bonding for 3D Integration (LTB-3D), 2017 5th International …	1	2017
Single-defect hexapole mode GeSn photonic crystal laser: Fabrication and simulation S Bao, H Qiu, Y Kim, Y Lin, HY Ryu, MY Ryu, YK Yeo, J Kouvetakis, ... CLEO: QELS_Fundamental Science, JTu5A. 110		2017
Source/Drain Asymmetry in InGaAs Vertical Nanowire MOSFETs X Zhao, C Heidelberger, EA Fitzgerald, JA del Alamo IEEE Transactions on Electron Devices 64 (5), 2161-2165	1	2017
Methods of Forming Strained-Semiconductor-on-Insulator Device Structures TA Langdo, MT Currie, R Hammond, AJ Lochtefeld, EA Fitzgerald US Patent App. 15/400,701		2017
MOCVD growth of GaN on SEMI-spec 200 mm Si L Zhang, KH Lee, IM Riko, CC Huang, A Kadir, KE Lee, SJ Chua, ... Semiconductor Science and Technology 32 (6), 065001	4	2017
Remote epitaxy through graphene enables two-dimensional material-based layer	34	2017

transfer Y Kim, SS Cruz, K Lee, BO Alawode, C Choi, Y Song, JM Johnson, ... Nature 544 (7650), 340		
Performance of 1 eV GaNAsSb□based photovoltaic cell on Si substrate at different growth temperatures NL Yurong, KH Tan, WK Loke, S Wicaksono, D Li, SF Yoon, P Sharma, ... Progress in Photovoltaics: Research and Applications 25 (4), 327-332	1	2017
The integration of InGaP LEDs with CMOS on 200 mm silicon wafers B Wang, KH Lee, C Wang, Y Wang, RI Made, WA Sasangka, VC Nguyen, ... Smart Photonic and Optoelectronic Integrated Circuits XIX 10107, 101070Y		2017
Germanium-on-insulator virtual substrate for InGaP epitaxy S Bao, KH Lee, C Wang, B Wang, RI Made, SF Yoon, J Michel, ... Materials Science in Semiconductor Processing 58, 15-21	3	2017
GaAsP/InGaP heterojunction bipolar transistors grown by MOCVD C Heidelberger, EA Fitzgerald Journal of Applied Physics 121 (4), 045703	2	2017
Methods of forming strained-semiconductor-on-insulator device structures TA Langdo, MT Currie, R Hammond, AJ Lochtefeld, EA Fitzgerald US Patent 9,548,236		2017
Growth of InGaAs-channel transistor layers on large-scale Si wafers for HeteroIntegration with Si CMOS XS Nguyen, S Yadav, KH Lee, D Kohen, A Kumar, RI Made, X Gong, ... CS Mantech	1	2017
Monolithic integration of CMOS and non-silicon devices EA Fitzgerald US Patent 9,530,763	2	2016
Relaxed silicon germanium platform for high speed CMOS electronics and high speed analog circuits EA Fitzgerald US Patent 9,515,196		2016
Controlling gaasp/sige interfaces EA Fitzgerald, P Sharma, T Milakovich US Patent 9,490,330		2016
Deep level traps in semi□polar n□GaN grown on patterned sapphire substrate by metalorganic vapor phase epitaxy XS Nguyen, HW Hou, P De Mierry, P Vennéguès, F Tendille, AR Arehart, ... physica status solidi (b) 253 (11), 2225-2229		2016
Epitaxy and wafer bonding of AlGaInP multiple-quantum wells and light-emitting diodes on 8 ″Si substrates B Wang, KH Lee, S Bao, C Wang, CS Tan, SF Yoon, EA Fitzgerald, ... Photonics Conference (IPC), 2016 IEEE, 791-792		2016
Optical antenna enhanced spontaneous emission rate in electrically injected	4	2016

nanoscale III–V led SA Fortuna, C Heidelberger, K Messer, K Han, EA Fitzgerald, ... Semiconductor Laser Conference (ISLC), 2016 International, 1-2		
novel integrated circuit platforms employing monolithic silicon CMOS+ GaN devices EA Fitzgerald, KE Lee, L Zhang, CC Huang, A Kadir, S Bao, Z Ren, ... ECS Transactions 75 (12), 31-37	2	2016
SiGe and III-V materials and devices: New HEMT and LED elements in 0.18-micron CMOS process and design EA Fitzgerald, KE Lee, SF Yoon, SJ Chua, CS Tan, GI Ng, X Zhou, ... ECS Transactions 75 (8), 439-446	9	2016
Heteroepitaxial growth of In0. 30Ga0. 70As high-electron mobility transistor on 200 mm silicon substrate using metamorphic graded buffer D Kohen, XS Nguyen, S Yadav, A Kumar, RI Made, C Heidelberger, ... AIP Advances 6 (8), 085106	7	2016
Integration of GaAs, GaN, and Si-CMOS on a common 200 mm Si substrate through multilayer transfer process KH Lee, S Bao, L Zhang, D Kohen, E Fitzgerald, CS Tan Applied Physics Express 9 (8), 086501	15	2016
Heavy p-type carbon doping of MOCVD GaAsP using CBrCl 3 C Heidelberger, EA Fitzgerald Journal of Crystal Growth 446, 7-11	3	2016
In 0.30 Ga 0.70 As QW MOSFETs with peak mobility exceeding 3000 cm 2/V· s fabricated on Si substrates S Yadav, D Kohen, XS Nguyen, KH Lee, X Gong, D Antoniadis, ... Silicon Nanoelectronics Workshop (SNW), 2016 IEEE, 126-127	2	2016
High quality Ge-OI, III–V-OI on 200 mm Si substrate KH Lee, Y Lin, S Bao, L Zhang, K Lee, J Michel, E Fitzgerald, CS Tan Silicon Nanoelectronics Workshop (SNW), 2016 IEEE, 160-161		2016
Temperature-and intensity-dependent photovoltaic measurements to identify dominant recombination pathways RE Brandt, NM Mangan, JV Li, RC Kurchin, T Milakovich, S Levcenco, ... Photovoltaic Specialists Conference (PVSC), 2016 IEEE 43rd, 1997-2001	1	2016
Towards demonstration of GaAs 0.76 P 0.24/Si dual junction step-cell SA Hadi, T Milakovich, R Shah, EA Fitzgerald, A Nayfeh Photovoltaic Specialists Conference (PVSC), 2016 IEEE 43rd, 1881-1886	3	2016
Deep level traps in GaN LEDs grown by metal organic vapour phase epitaxy on an 8 inch Si (111) substrate XS Nguyen, XL Goh, L Zhang, Z Zhang, AR Arehart, SA Ringel, ... Japanese Journal of Applied Physics 55 (6), 060306	6	2016
Direct MOCVD epitaxy of GaAsP on SiGe virtual substrate without growth of SiGe B Wang, C Wang, DA Kohen, RI Made, KEK Lee, T Kim, T Milakovich, ... Journal of Crystal Growth 441, 78-83	4	2016

Red InGaP light-emitting diodes epitaxially grown on engineered Ge-on-Si substrates B Wang, C Wang, KH Lee, S Bao, KEK Lee, CS Tan, SF Yoon, ... Light-Emitting Diodes: Materials, Devices, and Applications for Solid State …	1	2016
Metamorphic transistors: Building blocks for hetero-integrated circuits KE Lee, EA Fitzgerald MRS Bulletin 41 (3), 210-217	5	2016
Direct-Gap 2.1–2.2 eV AlInP solar cells on GaInAs/GaAs metamorphic buffers M Vaisman, K Mukherjee, T Masuda, KN Yaung, EA Fitzgerald, ML Lee IEEE Journal of Photovoltaics 6 (2), 571-577	2	2016
Theoretical efficiency limit for a two-terminal multi-junction “step-cell” using detailed balance method S Abdul Hadi, EA Fitzgerald, A Nayfeh Journal of Applied Physics 119 (7), 073104	8	2016
Reduction of threading dislocation density in Ge/Si using a heavily As-doped Ge seed layer KH Lee, S Bao, B Wang, C Wang, SF Yoon, J Michel, EA Fitzgerald, ... AIP Advances 6 (2), 025028	18	2016
Parameters influencing interfacial morphology in GaAs/Ge superlattices grown by metal organic chemical vapor deposition R Jia, EA Fitzgerald Journal of Crystal Growth 435, 50-55	3	2016
Heteroepitaxial growth of In In [subscript 0.30] Ga [subscript 0.70] As high-electron mobility transistor on 200 mm silicon substrate using metamorphic graded buffer D Kohen, XS Nguyen, S Yadav, A Kumar, RI Made, C Heidelberger, ... American Institute of Physics (AIP)		2016
Method of fabricating CMOS inverter and integrated circuits utilizing strained silicon surface channel MOSFETS EA Fitzgerald, N Gerrish US Patent 9,219,065	3	2015
Conductance slope and curvature coefficient of InGaAs/GaAsSb heterojunctions at varying band alignments and its implication on digital and analog applications RM Iutzi, EA Fitzgerald Journal of Applied Physics 118 (23), 235702	3	2015
Water purification and enhancement systems EA Fitzgerald, YH Xie, T Langdo, R Renjilian, CV Thompson US Patent 9,206,058		2015
Multilayer antireflection coating design for GaAs0. 69P0. 31/Si dual-junction solar cells S Saylan, T Milakovich, SA Hadi, A Nayfeh, EA Fitzgerald, MS Dahlem Solar Energy 122, 76-86	17	2015
Defect and temperature dependence of tunneling in InGaAs/GaAsSb		2015

heterojunctions with varying band alignments R Iutzi, C Heidelberger, E Fitzgerald Energy Efficient Electronic Systems (E3S), 2015 Fourth Berkeley Symposium on …		
Defect and temperature dependence of tunneling in InAs/GaSb heterojunctions RM Iutzi, EA Fitzgerald Applied Physics Letters 107 (13), 133504	4	2015
Spontaneous lateral phase separation of AlInP during thin film growth and its effect on luminescence K Mukherjee, AG Norman, AJ Akey, T Buonassisi, EA Fitzgerald Journal of Applied Physics 118 (11), 115306	5	2015
A driver circuit based on the emerging GaN-on-CMOS process for the emerging Electroluminescent panels T Ge, L Guo, Y Kang, J Zhou, H He, PJE Ng, E Fitzgerald, KEK Lee, ... Circuits and Systems (MWSCAS), 2015 IEEE 58th International Midwest …	1	2015
Demonstration of a novel dispersive spectral splitting optical element for cost-effective photovoltaic conversion C Maragliano, T Milakovich, M Bronzoni, S Rampino, EA Fitzgerald, ... arXiv preprint arXiv:1508.00210	3	2015
Nanostructured thin film silicon anodes for Li-ion microbatteries RS Omampuliyur, M Bhuiyan, Z Han, Z Jing, L Li, EA Fitzgerald, ... Journal of nanoscience and nanotechnology 15 (7), 4926-4933	9	2015
The role of AsH3 partial pressure on anti-phase boundary in GaAs-on-Ge grown by MOCVD–Application to a 200 mm GaAs virtual substrate D Kohen, S Bao, KH Lee, KEK Lee, CS Tan, SF Yoon, EA Fitzgerald Journal of Crystal Growth 421, 58-65	16	2015
Methods for forming semiconductor device structures TA Langdo, AJ Lochtefeld, R Hammond, MT Currie, EA Fitzgerald US Patent 9,064,930	2	2015
Theoretical efficiency limits of a 2 terminal dual junction step cell SA Hadi, T Milakovich, M Bulsara, E Polyzoeva, EA Fitzgerald, JL Hoyt, ... Photovoltaic Specialist Conference (PVSC), 2015 IEEE 42nd, 1-5	4	2015
Growth and characterization of GaAsP top cells for high efficiency III–V/Si tandem PV T Milakovich, R Shah, S Hadi, M Bulsara, A Nayfeh, E Fitzgerald Photovoltaic Specialist Conference (PVSC), 2015 IEEE 42nd, 1-4	7	2015
III–V/SiGe on Si radiation hard space cells with Voc> 2.6 V AM Carlin, EA Fitzgerald, SA Ringel Photovoltaic Specialist Conference (PVSC), 2015 IEEE 42nd, 1-4	4	2015
Enabling the integrated circuits of the future EA Fitzgerald, KE Lee, SF Yoon, SJ Chua, CS Tan, T Palacios, X Zhou, ... Electron Devices and Solid-State Circuits (EDSSC), 2015 IEEE International …	11	2015

Monolithic integration of III–V HEMT and Si-CMOS through TSV-less 3D wafer stacking KH Lee, S Bao, D Kohen, CC Huang, KEK Lee, E Fitzgerald, CS Tan Electronic Components and Technology Conference (ECTC), 2015 IEEE 65th, 560-565	6	2015
Controlled release apparatus and uses thereof TA Langdo, EA Fitzgerald, R Renjilian, LR Brown, RS Langer US Patent App. 14/370,584		2015
The Growth of Low Wafer Bow AlGaN/GaN Structure on 200mm Si (111) CC HUANG, F RIED, T PALACIOS, SJ CHUA, EA FITZGERALD Proceedings of CS MAN-TECH Conference. Scottsdale, Arizona, USA, 107-110	1	2015
Improved photoluminescence characteristics of order-disorder AlGaInP quantum wells at room and elevated temperatures K Mukherjee, PB Deotare, EA Fitzgerald Applied Physics Letters 106 (14), 142109	4	2015
Correlation of a generation-recombination center with a deep level trap in GaN XS Nguyen, K Lin, Z Zhang, B McSkimming, AR Arehart, JS Speck, ... Applied Physics Letters 106 (10), 102101	7	2015
Influences of annealing on lithium-ion storage performance of thick germanium film anodes RA Susantyoko, X Wang, L Sun, W Sasangka, E Fitzgerald, Q Zhang Nano Energy 12, 521-527	12	2015
Photo-attachment of biomolecules for miniaturization on wicking Si-nanowire platform H Cheng, H Zheng, JX Wu, W Xu, L Zhou, KC Leong, E Fitzgerald, ... PloS one 10 (2), e0116539	2	2015
Integration of III–V materials and Si-CMOS through double layer transfer process KH Lee, S Bao, E Fitzgerald, CS Tan Japanese Journal of Applied Physics 54 (3), 030209	28	2015
The role of AsH [subscript 3] partial pressure on anti-phase boundary in GaAs-on-Ge grown by MOCVD? Application to a 200mm GaAs virtual substrate D Kohen, S Bao, KH Lee, KEK Lee, CS Tan, SF Yoon, EA Fitzgerald Elsevier		2015
Design Optimization of Single-Layer Antireflective Coating for GaAs [subscript 1–x] xP [subscript x] x/Si Tandem Cells With x= 0, 0.17, 0.29, and 0.37 S Abdul Hadi, T Milakovich, MT Bulsara, S Saylan, MS Dahlem, ... Institute of Electrical and Electronics Engineers (IEEE)		2015
AlN-AlN layer bonding and it's thermal characteristics B Shuyu, KH Lee, GY Chong, EA Fitzgerald, CS Tan		2015
AlN-AlN layer bonding and its thermal characteristics S Bao, KH Lee, GY Chong, EA Fitzgerald, CS Tan ECS Journal of Solid State Science and Technology 4 (7), P200-P205	2	2015

Design Optimization of Single-Layer Antireflective Coating for GaAs $ _ {{\bf 1-}{\bm x}} $ P $ _ {\bm x} $/Si Tandem Cells With $\hbox {x}=\hbox {0} $, 0.17, 0.29, and... SA Hadi, T Milakovich, MT Bulsara, S Saylan, MS Dahlem, EA Fitzgerald, ... IEEE Journal of Photovoltaics 5 (1), 425-431	3	2015
Fabrication and thermal budget considerations of advanced Ge and InP SOLES substrates NY Pacella, MT Bulsara, C Drazek, E Guiot, EA Fitzgerald ECS Journal of Solid State Science and Technology 4 (7), P258-P264	3	2015
Defects reduction of Ge epitaxial film in a germanium-on-insulator wafer by annealing in oxygen ambient KH Lee, S Bao, GY Chong, YH Tan, EA Fitzgerald, CS Tan APL Materials 3 (1), 016102	15	2015
Method and apparatus for point of use water filtration TA Langdo, EA Fitzgerald, R Renjilian, LR Brown US Patent App. 14/365,502	1	2014
Determination of alloy composition and strain in multiple AlGaN buffer layers in GaN/Si system A Kadir, CC Huang, KE Kian Lee, EA Fitzgerald, SJ Chua Applied Physics Letters 105 (23), 232113	10	2014
Monolithic 3D integration in a CMOS process flow EA Fitzgerald, SF Yoon, CS Tan, T Palacios, X Zhou, LS Peh, CC Boon, ... SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S …	2	2014
Germanium coated vertically-aligned multiwall carbon nanotubes as lithium-ion battery anodes RA Susantyoko, X Wang, L Sun, KL Pey, E Fitzgerald, Q Zhang Carbon 77, 551-559	29	2014
Fabrication and characterization of germanium-on-insulator through epitaxy, bonding, and layer transfer KH Lee, S Bao, GY Chong, YH Tan, EA Fitzgerald, CS Tan Journal of Applied Physics 116 (10), 103506	28	2014
Methods of fabricating contact regions for FET incorporating SiGe EA Fitzgerald US Patent 8,822,282	33	2014
AlN-AlN wafer bonding and its thermal characteristics S Bao, KH Lee, GY Chong, EA Fitzgerald, CS Tan ECS Transactions 64 (5), 141-148	1	2014
Microstructure and conductance-slope of InAs/GaSb tunnel diodes RM Iutzi, EA Fitzgerald Journal of Applied Physics 115 (23), 234503	15	2014
Methods of forming strained-semiconductor-on-insulator device structures TA Langdo, MT Currie, R Hammond, AJ Lochtefeld, EA Fitzgerald US Patent 8,748,292	23	2014

Novel GaAs 0.71 P 0.29/Si tandem step-cell design SA Hadi, E Polyzoeva, T Milakovich, M Bulsara, JL Hoyt, EA Fitzgerald, ... Photovoltaic Specialist Conference (PVSC), 2014 IEEE 40th, 1127-1131	5	2014
Fabrication of germanium-on-insulator (GOI) with improved threading dislocation density (TDD) via buffer-less epitaxy and bonding KH Lee, S Bao, GY Chong, YH Tan, EA Fitzgerald, CS Tan Silicon-Germanium Technology and Device Meeting (ISTDM), 2014 7th …		2014
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