Curriculum Vitae

Notarization. I have read the following and certify that this *curriculum vitae* is a current and accurate statement of my professional record.

Signature Date 7/18/2023

In general, do not list a work or activity more than once.

I. Personal Information

I.A. UID, Last Name, First Name, Middle Name, Contact Information

UID:	115773158
Last Name:	Daniels
First (Middle) Name:	Kevin (Michael)
Address:	2305 A. V. Williams Building College Park, MD 20742, USA
Phone:	(301) 405-8028
Email:	danielkm@umd.edu
Department URL:	https://ece.umd.edu/clark/faculty/805/Kevin-Daniels
Research URL:	https://danielslab.umd.edu

I.B. Academic Appointments at UMD

- Assistant Professor, A. James Clark School of Engineering, Electrical & Computer Engineering Department. (August 1, 2017 - Present)
- Assistant Professor, College of Computer, Math & Natural Sciences, Institute for Research in Electronics and Applied Physics. (August 1, 2017 – Present)
- Affiliate Assistant Professor, A. James Clark School of Engineering, Materials Science & Engineering Department. (March 15, 2018 – Present)
- Fischell Institute Fellow. A. James Clark School of Engineering, Robert E. Fischell Institute for Biomedical Devices. (June 13, 2022- Present)
- General Assistant, Undergraduate Studies, UGST-Acad Achv-Intensive Education Dev. (May 31, 2022 - August 31, 2022)
- Assistant Professor, VP Administration, Environmental Safety, Sustainability & Risk. (May 31, 2018 - August 10, 2018)

I.C. Other Employment

- National Research Council Postdoctoral Fellow, U.S. Naval Research Laboratory, (August 2014 - August 2017)
- Graduate Research Assistant, University of South Carolina, (August 2009 - May 2014)

- Naval Research Enterprise Internship Program Intern, U.S. Naval Research Laboratory, (May 2009 - July 2009)
- Undergraduate Research Assistant, University of South Carolina, (October 2005 – May 2009)

I.D. Educational Background

- Ph.D., Electrical Engineering, University of South Carolina (May 2014)
  - Advisor: Prof. MVS Chandrashekhar
  - Thesis: "Defect Mediated Electrochemical Hydrogenation of Epitaxial Graphene: Towards Graphene Based Microbial Fuel Cells"
- M.E., Electrical Engineering, University of South Carolina, (December 2012)
- B.S., Electrical Engineering, University of South Carolina, (May 2009)

I.E. Continuing Education

- National Science Foundation Regional Innovation Corps (i-Corps). (2021)
- Workshop, University of Maryland Sustainability Teaching Fellows. (2018)
- Workshop, NSF CMMI CAREER Proposal Writing Workshop. (2018)
- Workshop, "Advancing Faculty Diversity," UMD ADVANCE. (2017 - 2018)
- Workshop, "Alan K. Alda Center for Communicating Science Workshop (2017)

I.F. Professional Certifications, Licenses, and Memberships

- Materials Research Society. (January 2020 - Present).
- American Association of Crystal Growth. (August 2019 - Present).

II. Research, Scholarly, Creative and/or Professional Activities

II.A. Refereed Journals

II.A.1. Refereed Journal Articles

Summary:
H-index = 15; 1172 citations (Google Scholar; retrieved July 18th, 2023)
https://orcid.org/0000-0002-5852-6334
https://scholar.google.com/citations?hl=en&authuser=2&user=PcoHU8wAAAAJ
20 papers published as faculty at UMD
Author roles: #=corresponding author; *=Daniels lab graduate student or postdoctoral fellow; ^-Daniels lab undergraduate student

J.1. Mazzoni, A.*, Burke, R., Chin, M., Najmaei, S., Dubey, M., Goldsman, N., **Daniels, K.**# (2022). Comparison of contact metals evaporated onto monolayer molybdenum

disulfide. ***Journal of Applied Physics***, *132*(22), 224305. http://dx.doi.org/10.1063/5.0124105 10.1063/5.0124105 IF=2.877; Times Cited: 0

J.2. Lewis, D.*, Jordan, B.*^, Pedowitz, M.*, Pennachio, D. J., Hajzus, J. R., Myers-Ward, R., **Daniels, K. M.**# (2022). Phonon assisted electron emission from quasi-freestanding bilayer epitaxial graphene microstructures. ***Nanotechnology***, *33*(37), 375202. http://dx.doi.org/10.1088/1361-6528/ac7653 10.1088/1361-6528/ac7653 IF=3.953; Times Cited: 0

J.3. Kim, S.*, Yoo, B., Miller, M.^, Bowen, D., Pines, D. J., **Daniels, K. M.** # (2022). EGaIn-Silicone-based highly stretchable and flexible strain sensor for real-time two joint robotic motion monitoring. ***Sensors and Actuators A: Physical***, *342*, 113659. http://dx.doi.org/10.1016/j.sna.2022.113659 10.1016/j.sna.2022.113659 IF=4.291; Times Cited: 3

J.4. Han, J. W., Chin, M. L., Matschy, S., Poojali, J., Seidl, A., Winnerl, S., Hafez, H. A., Turchinovich, D., Kumar, G., Myers-Ward, R. L., Dejarld, M. T., **Daniels, K. M.**, Drew, H. D., Murphy, T. E., Mittendorff, M. (2022). Plasmonic Terahertz Nonlinearity in Graphene Disks. ***Advanced Photonics Research,*** *3*(2), 2100218. http://dx.doi.org/10.1002/adpr.202100218 10.1002/adpr.202100218 IF=13.582; Times Cited: 0

J.5. Kim, S.*, Ryu, H., Tai, S., Pedowitz, M.*, Rzasa, J. R., Pennachio, D. J., Hajzus, J. R., Milton, D. K., Myers-Ward, R., **Daniels, K. M.** # (2022). Real-time ultra-sensitive detection of SARS-CoV-2 by quasi-freestanding epitaxial graphene-based biosensor. ***Biosensors and Bioelectronics***, *197*, 113803. http://dx.doi.org/10.1016/j.bios.2021.113803 10.1016/j.bios.2021.113803 IF=12.545; Times Cited: 17

J.6. Kotsakidis, J. C., Currie, M., Grubišić-Čabo, A., Tadich, A., Myers-Ward, R. L., DeJarld, M., **Daniels, K. M.**, Liu, C., Edmonds, M. T., Vázquez de Parga, A. L., Fuhrer, M. S., Gaskill, D. K. (2021). Increasing the Rate of Magnesium Intercalation Underneath Epitaxial Graphene on 6H-SiC(0001). ***Advanced Materials Interfaces***, *8*(23), 2101598. http://dx.doi.org/10.1002/admi.202101598 10.1002/admi.202101598 IF=6.389; Times Cited: 3

J.7. Grubišić-Čabo, A., Kotsakidis, J. C., Yin, Y., Tadich, A., Haldon, M., Solari, S., Di Bernardo, I., **Daniels, K. M.**, Riley, J., Huwald, E., Edmonds, M. T., Myers-Ward, R., Medhekar, N. V., Gaskill, D. K., Fuhrer, M. S. (2021). Magnesium-intercalated graphene on SiC: Highly n-doped air-stable bilayer graphene at extreme displacement fields. ***Applied Surface Science***, *541*, 148612. http://dx.doi.org/10.1016/j.apsusc.2020.148612 10.1016/j.apsusc.2020.148612 IF=7.392; Times Cited: 8

J.8. Chin, M. L., Matschy, S., Stawitzki, F., Poojali, J., Hafez, H. A., Turchinovich, D., Winnerl, S., Kumar, G., Myers-Ward, R. L., Dejarld, M. T., **Daniels, K. M.**, Drew, H. D., Murphy, T. E., Mittendorff, M. (2021). Observation of strong magneto plasmonic nonlinearity in bilayer graphene discs. ***Journal of Physics: Photonics***, *3*(1), 01LT01.

http://dx.doi.org/10.1088/2515-7647/abd7d0 10.1088/2515-7647/abd7d0 IF=3.89; Times Cited: 1

J.9. Pedowitz, M. D.*^, Kim, S.*, Lewis, D. I.*, Uppalapati, B., Khan, D., Bayram, F., Koley, G., **Daniels, K. M.** # (2020). Fast Selective Sensing of Nitrogen-Based Gases Utilizing δ-MnO_2-Epitaxial Graphene-Silicon Carbide Heterostructures for Room Temperature Gas Sensing. ***Journal of Microelectromechanical Systems**, 29*(5), 846-852. http://dx.doi.org/10.1109/jmems.2020.3007342 10.1109/jmems.2020.3007342 IF=2.829; Times Cited: 5

J.10. Kotsakidis, J. C., Grubišić-Čabo, A., Yin, Y., Tadich, A., Myers-Ward, R. L., DeJarld, M., Pavunny, S. P., Currie, M., **Daniels, K. M.**, Liu, C., Edmonds, M. T., Medhekar, N. V., Gaskill, D. K., Vázquez de Parga, A. L., Fuhrer, M. S. (2020). Freestanding n-Doped Graphene via Intercalation of Calcium and Magnesium into the Buffer Layer–SiC(0001) Interface. ***Chemistry of Materials**, 32*(15), 6464-6482. http://dx.doi.org/10.1021/acs.chemmater.0c01729 10.1021/acs.chemmater.0c01729 IF=10.508; Times Cited: 22

J.11. El Fatimy, A., Han, P., Quirk, N., St. Marie, L., Dejarld, M. T., Myers-Ward, R. L., **Daniels, K.**, Pavunny, S., Gaskill, D. K., Aytac, Y., Murphy, T. E., Barbara, P. (2019). Effect of defect-induced cooling on graphene hot-electron bolometers. ***Carbon**, 154*, 497-502. http://dx.doi.org/10.1016/j.carbon.2019.08.019 10.1016/j.carbon.2019.08.019 IF=11.307; Times Cited: 14

J.12. Pavunny, S. P., Myers-Ward, R. L., **Daniels, K. M.**, Shi, W., Sridhara, K., DeJarld, M. T., Boyd, A. K., Kub, F. J., Kohl, P. A., Carter, S. G., Gaskill, D. K. (2019). On the doping concentration dependence and dopant selectivity of photogenerated carrier assisted etching of 4H–SiC epilayers. ***Electrochimica Acta**, 323*, 134778. http://dx.doi.org/10.1016/j.electacta.2019.134778 10.1016/j.electacta.2019.134778 IF=7.336; Times Cited: 2

J.13. Pennachio, D. J., Ornelas-Skarin, C. C., Wilson, N. S., Rosenberg, S. G., **Daniels, K. M.**, Myers-Ward, R. L., Gaskill, D. K., Eddy, C. R., Palmstrøm, C. J. (2019). Tailoring commensurability of hBN/graphene heterostructures using substrate morphology and epitaxial growth conditions. ***Journal of Vacuum Science & Technology A**, 37*(5), 051503. http://dx.doi.org/10.1116/1.5110524 10.1116/1.5110524 IF=3.234; Times Cited: 7

J.14. Bloos, D., Kunc, J., Kaeswurm, L., Myers-Ward, R. L., **Daniels, K.**, DeJarld, M., Nath, A., van Slageren, J., Gaskill, D. K., Neugebauer, P. (2019). Contactless millimeter wave method for quality assessment of large area graphene. ***2D Materials**, 6*(3), 035028. http://dx.doi.org/10.1088/2053-1583/ab1d7e 10.1088/2053-1583/ab1d7e IF=6.861; Times Cited: 8

J.15. Jadidi, M. M., **Daniels, K. M.**, Myers-Ward, R. L., Gaskill, D. K., König-Otto, J. C., Winnerl, S., Sushkov, A. B., Drew, H. D., Murphy, T. E., Mittendorff, M. (2019). Optical Control of Plasmonic Hot Carriers in Graphene. ***ACS Photonics**, 6*(2), 302-307. http://dx.doi.org/10.1021/acsphotonics.8b01499 10.1021/acsphotonics.8b01499 IF=7.077; Times Cited: 21

J.16. Myers-Ward, R. L., Hobart, K. D., **Daniels, K. M.**, Giles, A. J., Tadjer, M. J., Luna, L. E., Kub, F. J., Pavunny, S. P., Carter, S. G., Banks, H. B., Glaser, E. R., Klein, P. B., Feygelson, B. N., Gaskill, D. K. (2018). Processing of Cavities in SiC Material for Quantum Technologies. ***Materials Science Forum***, *924*, 905-908. http://dx.doi.org/10.4028/www.scientific.net/msf.924.905 10.4028/www.scientific.net/msf.924.905 IF=0.48; Times Cited: 3

J.17. DeJarld, M., Campbell, P. M., Friedman, A. L., Currie, M., Myers-Ward, R. L., Boyd, A. K., Rosenberg, S. G., Pavunny, S. P., **Daniels, K. M.**, Gaskill, D. K. (2018). Surface potential and thin film quality of low work function metals on epitaxial graphene. ***Scientific Reports***, *8*(1). http://dx.doi.org/10.1038/s41598-018-34595-1 10.1038/s41598-018-34595-1 IF=4.997; Times Cited: 11

J.18. Kong, W., Li, H., Qiao, K., Kim, Y., Lee, K., Nie, Y., Lee, D., Osadchy, T., Molnar, R. J., Gaskill, D. K., Myers-Ward, R. L., **Daniels, K. M.**, Zhang, Y., Sundram, S., Yu, Y., Bae, S.-h., Rajan, S., Shao-Horn, Y., Cho, K., Ougazzaden, A., Grossman, J. C., Kim, J. (2018). Polarity governs atomic interaction through two-dimensional materials. ***Nature Materials***, *17*(11), 999-1004. http://dx.doi.org/10.1038/s41563-018-0176-4 10.1038/s41563-018-0176-4 IF=47.656; Times Cited: 176

J.19. El Fatimy, A., Nath, A., Kong, B. D., Boyd, A. K., Myers-Ward, R. L., **Daniels, K. M.**, Jadidi, M. M., Murphy, T. E., Gaskill, D. K., Barbara, P. (2018). Ultra-broadband photodetectors based on epitaxial graphene quantum dots. ***Nanophotonics***, *7*(4), 735-740. http://dx.doi.org/10.1515/nanoph-2017-0100 10.1515/nanoph-2017-0100 IF=7.923; Times Cited: 110

J.20. Barker, B. G., Chava, V. S., **Daniels, K. M.**, Chandrashekhar, M. V., Greytak, A. B. (2017). Sub-bandgap response of graphene/SiC Schottky emitter bipolar phototransistor examined by scanning photocurrent microscopy. ***2D Materials***, *5*(1), 011003. http://dx.doi.org/10.1088/2053-1583/aa90b1 10.1088/2053-1583/aa90b1 IF=6.861; Times Cited: 14

Journal Articles Published Prior to Joining UMD

J.21. **Daniels, K. M.**, Jadidi, M. M., Sushkov, A. B., Nath, A., Boyd, A. K., Sridhara, K., Drew, H. D., Murphy, T. E., Myers-Ward, R. L., Gaskill, D. K. (2017). Narrow plasmon resonances enabled by quasi-freestanding bilayer epitaxial graphene. ***2D Materials***, *4*(2), 025034. http://dx.doi.org/10.1088/2053-1583/aa5c75 10.1088/2053-1583/aa5c75 IF=6.861; Times Cited: 36

J.22. Nath, A., Kong, B. D., Koehler, A. D., Anderson, V. R., Wheeler, V. D., **Daniels, K. M.**, Boyd, A. K., Cleveland, E. R., Myers-Ward, R. L., Gaskill, D. K., Hobart, K. D., Kub, F. J., Jernigan, G. G. (2017). Universal conformal ultrathin dielectrics on epitaxial graphene enabled by a graphene oxide seed layer. ***Applied Physics Letters***, *110*(1), 013106. http://dx.doi.org/10.1063/1.4973200 10.1063/1.4973200 IF=3.971; Times Cited: 6

J.23. **Daniels, K. M.**, Obe, A., Daas, B. K., Weidner, J., Williams, C., Sudarshan, T. S., Chandrashekhar, M. (2016). Metal Catalyzed Electrochemical Synthesis of Hydrocarbons from Epitaxial Graphene. ***Journal of The Electrochemical Society***,

163(5), E130-E134. http://dx.doi.org/10.1149/2.0791605jes 10.1149/2.0791605jes IF=4.371; Times Cited: 7

J.24. Uddin, M. A., Singh, A., **Daniels, K.**, Vogt, T., Chandrashekhar, M. V., Koley, G. (2016). Impedance spectroscopic analysis of nanoparticle functionalized graphene/p-Si Schottky diode sensors. ***Japanese Journal of Applied Physics**, 55*(11), 110312. http://dx.doi.org/10.7567/jjap.55.110312 10.7567/jjap.55.110312 IF=1.491; Times Cited: 5

J.25. El Fatimy, A., Myers-Ward, R. L., Boyd, A. K., **Daniels, K. M.**, Gaskill, D. K., Barbara, P. (2016). Epitaxial graphene quantum dots for high-performance terahertz bolometers. ***Nature Nanotechnology**, 11*(4), 335-338. http://dx.doi.org/10.1038/nnano.2015.303 10.1038/nnano.2015.303 IF=40.523; Times Cited: 110

J.26. Rana, T., Chandrashekhar, M.V.S., **Daniels, K.**, Sudarshan, T. (2016). SiC Homoepitaxy, Etching and Graphene Epitaxial Growth on SiC Substrates Using a Novel Fluorinated Si Precursor Gas (SiF4). ***Journal of Electronic Materials**, 45*(4), 2019-2024. http://dx.doi.org/10.1007/s11664-015-4234-2 10.1007/s11664-015-4234-2 IF=2.047; Times Cited: 7

J.27. **Daniels, K. M.**, Shetu, S., Staser, J., Weidner, J., Williams, C., Sudarshan, T. S., Chandrashekhar, M. (2015). Mechanism of Electrochemical Hydrogenation of Epitaxial Graphene. ***Journal of The Electrochemical Society**, 162*(4), E37-E42. http://dx.doi.org/10.1149/2.0191504jes 10.1149/2.0191504jes IF=4.371; Times Cited: 10

J.28. Jadidi, M. M., Sushkov, A. B., Myers-Ward, R. L., Boyd, A. K., **Daniels, K. M.**, Gaskill, D. K., Fuhrer, M. S., Drew, H. D., Murphy, T. E. (2015). Tunable Terahertz Hybrid Metal–Graphene Plasmons. ***Nano Letters**, 15*(10), 7099-7104. http://dx.doi.org/10.1021/acs.nanolett.5b03191 10.1021/acs.nanolett.5b03191 IF=12.262; Times Cited: 163

J.29. Rana, T., Chandrashekhar, M. V., **Daniels, K.**, Sudarshan, T. (2015). Epitaxial growth of graphene on SiC by Si selective etching using SiF_4in an inert ambient. ***Japanese Journal of Applied Physics**, 54*(3), 030304. http://dx.doi.org/10.7567/jjap.54.030304 10.7567/jjap.54.030304 IF=2.877; Times Cited: 20

J.30. Coletti, C., Forti, S., Principi, A., Emtsev, K. V., Zakharov, A. A., **Daniels, K. M.**, Daas, B. K., Chandrashekhar, M. V., Ouisse, T., Chaussende, D., MacDonald, A. H., Polini, M., Starke, U. (2013). Revealing the electronic band structure of trilayer graphene on SiC: An angle-resolved photoemission study. ***Physical Review B**, 88*(15). http://dx.doi.org/10.1103/physrevb.88.155439 10.1103/physrevb.88.155439 IF=3.908; Times Cited: 111

J.31. Shetu, S. S., Omar, S. U., **Daniels, K. M.**, Daas, B., Andrews, J., Ma, S., Sudarshan, T. S., Chandrashekhar, M. V. (2013). Si-adatom kinetics in defect mediated growth of

multilayer epitaxial graphene films on 6H-SiC. ***Journal of Applied Physics***, *114*(16), 164903. http://dx.doi.org/10.1063/1.4826899 10.1063/1.4826899 IF=2.877; Times Cited: 12

J.32. **Daniels, K. M.**, Shetu, S., Staser, J., Weidner, J. W., Williams, C., Sudarshan, T., Chandrashekhar, M.V.S. (2013). Electrochemical Hydrogenation of Dimensional Carbon. ***ECS Transactions***, *58*(4), 439-445. http://dx.doi.org/10.1149/05804.0439ecst 10.1149/05804.0439ecst IF=0.64; Times Cited: 4

J.33. Daas, B. K., **Daniels, K. M.**, Shetu, S., Sudarshan, T. S., Chandrashekhar, M.V.S. (2012). Study of Epitaxial Graphene on Non-Polar 6H-SiC Faces. ***Materials Science Forum***, *717-720*, 633-636. http://dx.doi.org/10.4028/www.scientific.net/msf.717-720.633 10.4028/www.scientific.net/msf.717-720.633 IF=0.48; Times Cited: 0

J.34. Daas, B. K., Nomani, W. K., **Daniels, K. M.**, Sudarshan, T. S., Koley, G., Chandrashekhar, M.V.S. (2012). Molecular Gas Adsorption Induced Carrier Transport Studies of Epitaxial Graphene Using IR Reflection Spectroscopy. ***Materials Science Forum***, *717-720*, 665-668. http://dx.doi.org/10.4028/www.scientific.net/msf.717-720.665 10.4028/www.scientific.net/msf.717-720.665 IF=0.48; Times Cited: 8

J.35. **Daniels, K. M.**, Daas, B. K., Srivastava, N., Williams, C., Feenstra, R. M., Sudarshan, T. S., Chandrashekhar, M.V.S. (2012). Evidence of Electrochemical Graphene Functionalization by Raman Spectroscopy. ***Materials Science Forum***, *717-720*, 661-664. http://dx.doi.org/10.4028/www.scientific.net/msf.717-720.661 10.4028/www.scientific.net/msf.717-720.661 IF=0.48; Times Cited: 5

J.36. Daas, B. K., Omar, S. U., Shetu, S., **Daniels, K. M.**, Ma, S., Sudarshan, T. S., Chandrashekhar, M. V. (2012). Comparison of Epitaxial Graphene Growth on Polar and Nonpolar 6H-SiC Faces: On the Growth of Multilayer Films. ***Crystal Growth & Design***, *12*(7), 3379-3387. http://dx.doi.org/10.1021/cg300456v 10.1021/cg300456v IF=4.01; Times Cited: 48

J.37. **Daniels, K. M.**, Daas, B. K., Srivastava, N., Williams, C., Feenstra, R. M., Sudarshan, T. S., Chandrashekhar, M. V. (2012). Evidences of electrochemical graphene functionalization and substrate dependence by Raman and scanning tunneling spectroscopies. ***Journal of Applied Physics***, *111*(11), 114306. http://dx.doi.org/10.1063/1.4725489 10.1063/1.4725489 IF=2.877; Times Cited: 31

J.38. Daas, B. K., **Daniels, K. M.**, Sudarshan, T. S., Chandrashekhar, M. V. (2011). Polariton enhanced infrared reflection of epitaxial graphene. ***Journal of Applied Physics***, *110*(11), 113114. http://dx.doi.org/10.1063/1.3666069 10.1063/1.3666069 IF=2.877; Times Cited: 36

J.39. Meyer, D. J., Bass, R., Katzer, D. S., Deen, D. A., Binari, S. C., **Daniels, K. M.**, Eddy, C. R. (2010). Self-aligned ALD AlOx T-gate insulator for gate leakage current suppression in SiNx-passivated AlGaN/GaN HEMTs. ***Solid-State Electronics***, *54*(10), 1098-1104.

http://dx.doi.org/10.1016/j.sse.2010.05.024 10.1016/j.sse.2010.05.024 IF=1.916; Times Cited: 21

J.40. Tedesco, J. L., Jernigan, G. G., Culbertson, J. C., Hite, J. K., Yang, Y., **Daniels, K. M.**, Myers-Ward, R. L., Eddy, C. R., Robinson, J. A., Trumbull, K. A., Wetherington, M. T., Campbell, P. M., Gaskill, D. K. (2010). Morphology characterization of argon-mediated epitaxial graphene on C-face SiC. ***Applied Physics Letters***, *96*(22), 222103. http://dx.doi.org/10.1063/1.3442903 10.1063/1.3442903 IF=3.971; Times Cited:116

II.B. Published Conference Proceedings

II.B.1. Refereed Conference Proceedings

1. Pedowitz, M.*, Kim, S. *, Lewis, D. *, Uppalapati, B., Khan, D., Bayram, F., Koley, G., **Daniels, K.** (2021). Green Three-Step Electrodeposition of Mn^{+3} Rich Layered δ-Phase MnO_2 Nanofibers on Silicon and Epitaxial Graphene-Silicon Carbide Heterostructures. 2021 Electrochemical Society Meeting. The Electrochemical Society. Meet. Abstr. MA2021-01 1937. http://dx.doi.org/10.1149/MA2021-01471937mtgabs

2. Chin, M. L., Stawizki, F., Matschy, S., Poojali, J., Hafez, H. A., Turchinovich, D., Winnerl, S., Kumar, G., Myers-Ward, R. L., Dejarld, M. T., **Daniels, K.**, Murphy, T. E., Mittendorff, M. (2020) Magnetically Tuned THz Nonlinearity in Bilayer Graphene Disk Arrays. in Conference on Lasers and Electro-Optics, OSA Technical Digest (Optica Publishing Group, 2020), paper STu4G.2.

3. Jadidi, M. M., Sushkov, A. B., Myers-Ward, R. L., Boyd, A. K., **Daniels, K.**, Gaskill, D. K., Fuhrer, M. S., Drew, H. D., Murphy, T. E. (2016). Terahertz plasmon resonances in graphene-filled subwavelength metallic apertures. in Conference on Lasers and Electro-Optics, OSA Technical Digest (online) (Optica Publishing Group, 2016), paper FTu1B.5.

4. Jadidi, M. M., Sushkov, A. B., Mittendorff, M., **Daniels, K. M.,** Boyd, A. K., Myers-Ward, R. L., Drew, H. D., Fuhrer, M. S., Gaskill, D. K., Murphy, T. E. (2016). Graphene plasmonics for terahertz photonics. in 2016 IEEE Photonics Conference (IPC). IEEE. http://dx.doi.org/10.1109/ipcon.2016.7830956

5. Chava, V. S.N., Chandrashekhar, M. V., **Daniels, K. M.,** Barker, B. G., Greytak, A. B. (2016). Epitaxial graphene (EG)/SiC based Schottky emitter bipolar phototransistors for UV detection and effect of hydrogen intercalation on device I-V characteristics. in 2016 IEEE SENSORS. IEEE. http://dx.doi.org/10.1109/icsens.2016.7808587

6. **Daniels, K. M.,** Jadidi, M. M., Sushkov, A. B., Boyd, A. K., Nath, A., Drew, H. D., Murphy, T.E., Myers-Ward, R. L., Gaskill, D. K. (2016). Narrow terahertz plasmon resonance of quasi-freestanding bilayer epitaxial graphene. in 2016 74th Annual Device Research Conference (DRC). IEEE. http://dx.doi.org/10.1109/drc.2016.7548425

7. Uddin, M.A., Singh, A.K., **Daniels, K.M.,** Chandrashekhar, M.V.S., Koley, G. (2015). Impedance spectroscopic analysis of Functionalized Graphene/silicon Schottky Diode sensor. in 2015 Transducers - 2015 18th International Conference on Solid-

State Sensors, Actuators and Microsystems (TRANSDUCERS). IEEE. http://dx.doi.org/10.1109/transducers.2015.7181190

8. Shetu, S. S., Daas, B., **Daniels, K. M.,** Sudarshan, T.S., Koley, G., Chandrashekhar, M. V. (2013). Selective multimodal gas sensing in epitaxial graphene by fourier transform infrared spectroscopy. in 2013 IEEE SENSORS. IEEE. http://dx.doi.org/10.1109/icsens.2013.6688517

9. Meyer, D.J., Bass, R., Katzer, D.S., Deen, D.A., Binari, S.C., **Daniels, K.M.,** Eddy, C.R. (2009). Self-aligned ALD AlOx T-gate footprint insulator for gate leakage current suppression in SiNx passivated AlGaN/GaN HEMTs. in 2009 International Semiconductor Device Research Symposium. IEEE. http://dx.doi.org/10.1109/isdrs.2009.5378279

10. Feng Zhao, **Daniels, K.,** Laney, Z., Sudarshan, T.S. (2009). A novel etching technique for crystallographic study of SiC materials. in 2009 International Semiconductor Device Research Symposium. IEEE. http://dx.doi.org/10.1109/isdrs.2009.5378289

11. Coletti, C., Forti, S., Principi, A., Emtsev, K.V., Zakharov, A.A., **Daniels, K.M.,** Daas, B.K., Chandrashekhar, M.V.S., MacDonald, A.H., Polini, M., Starke, U. (2014). Revealing the electronic band structure of quasi-free trilayer graphene on SiC(0001). *MRS Proceedings, 1693*. http://dx.doi.org/10.1557/opl.2014.610 10.1557/opl.2014.610

II.C. Conferences, Workshops, and Talks

II.C.1. Invited Talks

1. **Daniels, K. M.,** "The Carbon Scaffold: Building Next-Generation Materials and Devices on Quasi-freestanding Epitaxial Graphene," Seminar, Mohammed VI Polytechnic University, Ben Guerir, Morocco (June 2023)

2. **Daniels, K. M.,** "Ultrasensitive Rapid Pathogen Detection Platform Using Quasi-Freestanding Epitaxial Graphene," 30th Biodetection Technologies Virtual Event, Biothreat & Pathogen Detection, Advanced Technologies for Detection, Diagnostics and Analytics, Rapid and Future Technologies for Biodetection, Virtual. (June 2023)

3. **Daniels, K. M.,** "The Carbon Scaffold: Building Next-Generation Materials and Devices on Epitaxial Graphene," 2D Crystal Consortium-Materials Innovation Platform Webinar, Pennsylvania State (May 2023)

4. **Daniels, K. M.,** "The Carbon Scaffold: Building Next-Generation Materials and Devices on Epitaxial Graphene," Seminar, Georgetown University (April 2023)

5. **Daniels, K.M**, "The Carbon Scaffold: Building Next-Generation Materials and Devices on Epitaxial Graphene," Central European institute of Technology, Virtual-Zoom. (April 2022).

6. **Daniels, K. M.,** Kim, S., "Epitaxial Graphene-Based Biosensors for Rapid Detection of COVID-19," 2022 Korean Physical Society Spring Meeting, Zoom. (April 2022).

7. **Daniels, K. M.**, "The Carbon Scaffold: Building Next-Generation Materials and Sensors," Army Research Laboratory. (October 25, 2021).

8. **Daniels, K.**, MAMNA Seminar, "The Carbon Scaffold: Building Next-Generation Sensors and Electronics on Epitaxial Graphene," Peer-Reviewed, MAMNA, Zoom/YouTube. (June 18, 2020).

9. **Daniels, K. M.**, LPS Day, "Synthesis and Applications of Dimensional Materials on Epitaxial Graphene," University of Maryland, LPS, College Park, MD, United States. (October 2019).

II.C.2. Refereed Presentations

Summary:

25 Total Conference Presentations

24 Refereed Oral Presentations; 1 Refereed Posters by Daniels Lab Trainees

Author roles: #=presenting author; *=Daniels lab graduate student or postdoctoral fellow; ^-Daniels lab undergraduate student

P1. Pedowitz, M.#*, DeMell, J.*, Lewis, D.*, **Daniels, K.**, 65th Electronic Materials Conference, "Transformation to Alkali Birnessites via Simple Intercalation of Electrochemically Grown 2D-Layered H-Type Manganese Dioxide on Epitaxial Graphene", University of California: Santa Barbara, Santa Barbara, CA. (June 28, 2023- June 30, 2023).

P2. Lewis, D.*, **Daniels, K#.**, "Non-Conductive Electron Transport Through a Quasi Freestanding Epitaxial Graphene-Insulator Heterostructure Towards a Vacuum-Independent X-Ray Source", University of California: Santa Barbara, Santa Barbara, CA. (June 28, 2023-June 30, 2023).

P3. Jordan, B. #*, Lewis, D.*, **Daniels, K.**, "Growth and Characterization of Multigrain SmB6 Thin Films by Chemical Vapor Deposition" University of California: Santa Barbara, Santa Barbara, CA. (June 28, 2023-June 30, 2023).

P4. Pedowitz, M.#*, Lewis, D.*, Kim, S.*, **Daniels, K.**, 68th American Vacuum Society, "Electrodeposition of Nanofiberous H-Type MnO2 Birnessite on Epitaxial Graphene Silicon Carbide Heterostructures, and transformation to Alkali Birnessites (Na) via Simple Intercalation," American Vacuum Society, David L. Lawrence Convention Center, Pittsburg, PA. (November 6, 2022 - November 11, 2022).

P5. Pedowitz, M.#*, Lewis, D.*, Kim, S.*, **Daniels, K.**, 242nd Electrochemical Society Meeting, "Green Three-Step Electrodeposition of Nanofiberous H-type MnO2 Birnessite on Epitaxial Graphene – Silicon Carbide Heterostructures and Transformation to Na-Type Birnessite Via Simple Intercalation," Electrochemical Society, Atlanta Hilton, Atlanta, GA. (October 9, 2022 - October 13, 2022).

P6. Pedowitz, M.#*, Lewis, D.*, Kim, S.*, **Daniels, K.**, 64th Electronic Materials Conference, "Growth and Transformation of Mixed Valence Manganese Oxide Nanostructures on Epitaxial Graphene Silicon Carbide Heterostructures," Materials

Research Society, Ohio State University, Columbus, OH. (June 30, 2022). Best Student Presentation Honorable Mention

P7. Kim, S.*****, Ryu, H., Tai, S., Pedowitz, M.*, Rzasa, J. R., Pennachio, D. J., Hajzus, J., Milton, D., Myers-Ward, R. L., **Daniels, K.**#, 64th Electronic Materials Conference, "Lattice Strain Induced Biosensing of SARS-CoV-2 Enabled by Quasi-Freestanding Epitaxial Graphene," Materials Research Society, Ohio State University, Columbus, OH. (June 29, 2022).

P8. Kim, S.#*, Ryu, H., Tai, S., Pedowitz, M.*, Rzasa, J. R., Pennachio, D. J., Hajzus, J., Milton, D., Myers-Ward, R. L., **Daniels, K.**, 7th International Conference on Electronic Materials and Nanotechnology for Green Environment, "Lattice Strain Induced Biosensing of SARS-CoV-2 Enabled by Quasi-Freestanding Epitaxial Graphene," Korean Federation of Science & Technology Societies, Jeju Convention & Visitors Bureau and Korea Tourism Organization, Ramada Jeju Hotel, Jeju, South Korea. (June 29, 2022).

P9. Lewis, D.#*, **Daniels, K.**, 64th Electronic Materials Conference, "Electron Emission Sources from Quasi-Freestanding Epitaxial Graphene Planar Devices," Materials Research Society, Ohio State University, Columbus, OH. (June 29, 2022).

P10. Kim, S.#*, Park, J., Pedowitz, M.,* Lewis, D.*, Lee, S., Uppalapati, B., Khan, D., Bayram, F., Koley, G., Kang, S.-W., **Daniels, K.**, 67th American Vacuum Society Symposium, "Room Temperature Chemical Sensors Based on Molybdenum Disulfide Nanoflower/Epitaxial Graphene Heterostructure," American Vacuum Society, Charlotte Convention Center, Charlotte, NC. (October 24, 2021 - October 29, 2021).

P11. Pedowitz, M.#*, Kim, S.*, Uppalapti, B., Khan, D., Bayram, F., Koley, G., Myers-Ward, R., **Daniels, K.**, 67th American Vacuum Society Symposium, "Electrodeposition of Mn^{+3} Rich Layered δ-Phase Mno2 Nanofibers on Epitaxial Graphene-Silicon Carbide Heterostructures for Fast Selective Gas Sensing," American Vacuum Society, Zoom. (October 24, 2021 - October 29, 2021).

P12. Pedowitz, M.#*, Lewis, D.*, **Daniels, K.**, 22nd American Conference on Crystal Growth and Epitaxy, "Transformation Of Birnessite MnO2 On Epitaxial Graphene/Silicon Carbide To Mn3O4 On Epitaxial Graphene/Silicon Carbide Via Simple Heat Treatment," American Association for Crystal Growth, Zoom. (August 2, 2021 - August 4, 2021).

P13. Kim, S. #*, Ryu, H., Tai, S., Pedowitz, M.*, Milton, D., Myers-Ward, R., **Daniels, K.**, 63rd Electronic Materials Conference, "Rapid Detection of COVID-19 via Epitaxial Graphene Based Sensor," Materials Research Society, Zoom. (June 23, 2021 - June 25, 2021).

P14. Lewis, D.#*, **Daniels, K.**, 63rd Electronic Materials Conference, "Characteristics and Tunability of Electron Emission Sources from Quasi-Freestanding Epitaxial Graphene Microstructures," Materials Research Society, Zoom. (June 23, 2021 - June 25, 2021).

P15. Pedowitz, M.#*, Kim, S.*, Uppalapti, B., Khan, D., Bayram, F., Koley, G., Myers-Ward, R., **Daniels, K.**, 63rd Electronic Materials Conference, "Mn^{+3} Rich Nanofiberous Layered δ-Phase MnO2 on Epitaxial Graphene-Silicon Carbide for Selective Gas Sensing," Materials Research Society, Zoom. (June 23, 2021 - June 25, 2021).

P16. Kim, S.#*, Ryu, H., Tai, S., Pedowitz, M.*, Milton, D., Myers-Ward, R., **Daniels, K.**, 22nd American Conference on Crystal Growth and Epitaxy, "Epitaxial Graphene Based Sensor For Rapid Detection Of COVID-19 From Exhaled Breath Aerosol," American Association for Crystal Growth, Zoom. (May 30, 2021 - June 3, 2021).

P17. Pedowitz, M.#*, Kim, S.*, Lewis, D.*, Uppalapti, B., Khan, D., Bayram, F., Koley, G., Myers-Ward, R., **Daniels, K.**, 239th ECS Meeting, "Green Three-Step Electrodeposition of Mn+3 Rich Layered δ-Phase MnO2 Nanofibers on Silicon and Epitaxial Graphene-Silicon Carbide Heterostructures," The Electrochemical Society, Zoom. (May 30, 2021 - June 3, 2021).

P18. Pedowitz, M.#*, Kim, S.*, Uppalapti, B., Khan, D., Bayram, F., Koley, G., Myers-Ward, R., **Daniels, K.**, APS March Meeting 2021, "Mn^{+3} Rich Nanofiberous Layered δ-Phase MnO2 on Epitaxial Graphene-Silicon Carbide for Selective Gas Sensing," American Physical Society, Zoom. (March 15, 2021 - March 19, 2021).

P19. Poojali, J., Joint, F., **Daniels, K.**, Zhang, K., Ali, A., Murphy, T., Drew, H., APS March Meeting 2021, "Modeling and fabrication of a PTE THz mixer on epitaxial graphene," American Physical Society, Zoom. (March 15, 2021 - March 19, 2021).

P20. Avash, I. A.#*, Pedowitz, M.*, Cassuto, G.*, **Daniels, K.**, 62nd Electronic Materials Conference, "Growth of Manganese (IV) Selenide on Epitaxial Graphene by Thermal Vapor Selenification of Electrodeposited ë-Phase Manganese (IV) Oxide," Materials Research Society. (June 25, 2020).

P21. Kim, S.#*, Pedowitz, M.*, Lewis, D.*, **Daniels, K.**, 62nd Electronic Materials Conference, "MoS2 Nanoflower/Epitaxial Graphene Heterostructure for Chemical Sensing," Materials Research Society. (June 24, 2020).

P22. Pedowitz, M. #*, Kim, S.*, Lewis, D*., **Daniels, K.**, 62nd Electronic Materials Conference, "Layered δ-phase MnO2 Nanofibers-Epitaxial Graphene-Silicon Carbide Heterostructures for Fast and Selective Room Temperature Gas Sensing," Materials Research Society. (June 24, 2020).

P23. Kim, S.#*, **Daniels, K.**, 19th International Conference on Crystal Growth and Epitaxy (ICCGE-19) and the 19th US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-19), "Chemical Sensing with MoS2/Graphene heterostructure on Silicon Carbide," Keystone, CO, United States. (August 2019).

P24. Kim, S. #*, Park, J., Lee, S., Krishna, S., Kang, S.-W., **Daniels, K.**, 61st Electronic Materials Conference, "MoS2/Graphene Heterostructure for Gas Sensing," Materials Research Society, University of Michigan, Ann Arbor, MI. (June 26, 2019 - June 28, 2019).

<u>Presentations before joining UMD</u>

P25. **Kevin M. Daniels**#, A. K. Boyd, R. L. Myers-Ward, D. K. Gaskill, "Mechanisms of Hydrogen Intercalation in Epitaxial Graphene", International Semiconductor Device Research Symposium 2016, Bethesda, MD (2016)

P26. **Kevin M. Daniels**#, M. Jadidi, A. Sushkov, A. Nath, A. Boyd, H. Dennis Drew, R. Myers-Ward, D. K. Gaskill, "THz Plasmonics of Quasi-freestanding Bilayer Epitaxial Graphene", 74th Device Research Conference 2016, Newark, DE (2016)

P27. **Kevin M. Daniels**#, M. Jadidi, A. Sushkov, A. Nath, A. Boyd, H. Dennis Drew, R. Myers-Ward, D. K. Gaskill, "THz Plasmonics of Quasi-freestanding Bilayer Epitaxial Graphene via H-intercalation" APS March Meeting 2016, Baltimore, MD (2016)

P28. **Kevin M. Daniels**#, A. Boyd, R. Myers-Ward, D. K. Gaskill, "Systematic Hydrogen Intercalation of Epitaxial Graphene for THz Plasmonics" AVS 62nd International Symposium & Exhibition, San Jose, CA (2015)

P29. **Kevin M. Daniels**#, A. Boyd, R. Myers-Ward, D. K. Gaskill, "Growth of High Mobility Epitaxial Graphene via Systematic Hydrogen Intercalation for THz Plasmonics", 20th American Conference on Crystal Growth and Epitaxy: 2D Electronic Materials Symposium, Big Sky, MT (2015)

P30. **Kevin M. Daniels**#, S. Shetu, J. Weidner, C. Williams, T. S. Sudarshan, MVS Chandrashekhar, "Influences of Non-Idealities on Electrochemistry of Epitaxial Graphene", 56th Electronic Materials Conference, University of California, Santa Barbara, CA (2014)

P31. **Kevin M. Daniels**#, S. Shetu, J. Staser, J. W. Weidner, C. Williams, T. S. Sudarshan, MVS Chandrashekhar, "Electrochemical Hydrogenation of Dimensional Carbon", 244th ECS Meeting, San Francisco, CA (2013)

P32. **Kevin M. Daniels**#, S. Shetu, J. Staser, J. W. Weidner, C. Williams, T. S. Sudarshan, MVS Chandrashekhar, "History Dependence of Reversible Electrochemical Hydrogenation of Epitaxial Graphene/SiC", 55th Electronic Material Conference, University of Notre Dame, South Bend, IN (2013)

P33. **Kevin M. Daniels**#, N. Aich, K. P. Miller, B. K. Daas, N. Saleh, A. W. Decho, T. S. Sudarshan, MVS Chandrashekhar, "Biological Sensing Applications of Epitaxial Graphene", 54th Electronic Material Conference, Pennsylvania State University, University Park, PA (2012)

P34. **Kevin M. Daniels**#, B. K. Daas, N. Srivastava, C. Williams, R. M. Feenstra, T.S. Sudarshan, MVS Chandrashekhar "Evidence of Electrochemical Graphene Functionalization by Raman and Scanning Tunneling Spectroscopy ", International Conference on Silicon Carbide and Related Materials 2011, Cleveland, OH (2011)

P35. **Kevin M. Daniels**#, B. K. Daas, R. Zhang, J. Weidner, C. Williams, T.S. Sudarshan, MVS Chandrashekhar "Electrochemical Graphane Conversion using E-beam Evaporated Metals for Catalytic Enhancement" 53rd Electronic Material Conference, University of California, Santa Barbara, CA (2011)

P36. **Kevin M. Daniels**#, B. K. Daas, R. Zhang, J. Weidner, C. Williams, T.S. Sudarshan, MVS Chandrashekhar", Graphene to Graphane: Novel Electrochemical Conversion and Possible Applications" 52nd Electronic Material Conference, Notre Dame, IN (2010)

P37. **Kevin. M. Daniels**#, Z. Laney, F. Zhao, T. S. Sudarshan, "A Novel Etching Technique for Crystallographic Study of SiC Materials" International Semiconductor Device Research Symposium 2009, University of Maryland, College Park, MD (2009)

II.C.3. Refereed Posters

P38. **Daniels, K., M.** #, Hilton Head 2022 Solid-State Sensors Actuators and Microsystems Workshop, "Advanced Manufacturing Laboratory at the University of Maryland," Hilton Head, SC (June 5, 2022 – June 9, 2022)

P39. Lewis, D.#*, **Daniels, K.**, APS March Meeting 2021, "Epitaxial Graphene Microstructures as Electron Emission Sources Towards Emission of Soft X-rays," American Physical Society, Zoom. (March 15, 2021 - March 19, 2021).

II.C.4. Non-Refereed Presentations

1. **Daniels, K. M**., Successful Bid for Electronic Materials Conference to be held at the University of Maryland in 2024

2. **Daniels, K. M.**, Electrical and Computer Engineering Department Advisory Board, University of Maryland, "Growth of Two-Dimensional Materials – Applications in Energy and Sensing" (Nov. 2017)

II.C.5. Non-Refereed Panels

1. ENGR CAREER Proposal Town Hall, A. James Clark School of Engineering, University of Maryland. (May 2022)

2. Assistant Professors Panel for the Future Faculty Fellows Class, A. James Clark School of Engineering, University of Maryland (May 2022)

3. ENES601Panel: Experiences of Assistant Professors, A. James Clark School of Engineering, University of Maryland (Mar. 2019)

4. University of South Carolina's Grace Jordan McFadden Professors Program Program supporting underrepresented minorities in the graduate program and the professoriate (Mar. 2018)

5. National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE), The Imposter Syndrome Panel (Nov. 2017)

<u>II.D. Completed Creative Works and Scholarship</u>

II.D.1. Inventions

I1. "The Coronalyzer: An Ultra-sensitive Graphene-based Wireless Sensor System for Detecting COVID-19, Other Viruses, and Gases from Normal Breathing", Daniels, Kevin M. Primary, Kim, Soaram Inventor, Rzasa, John Robertson Inventor (2021-152 - Physical Sciences), Status: 5 high priority; disclosure complete, ready for marketing. Disclosed: May 25, 2021.

I2. "Epitaxial Graphene based Biosensor for Rapid Detection of COVID-19", Kim, Soaram Inventor, Daniels, Kevin M. Primary, Ryu, Heeju Inventor, Kim, Seo Hyun Inventor, Ward, Rachael Myers Inventor (2021-033 - Physical Sciences), Status: 5 high priority; disclosure complete, ready for marketing. Disclosed: August 22, 2020.

II.E. Works in Progress

1. Han, J. W., Sai, P., But, D., Uyker, E., Winnerl, S., Kumar, G., Chin, M. L., Myers-Ward, R. L., Dejarld, M. T., Daniels, K. M., Murphy, T. E., Knap, W., Mittendorff, M. "Strong transient magnetic fields induced by THz-driven plasmons in graphene disks", Under Review Nature Communications

2. Francois, J., Zhang, K., Poojal, J., Lewis, D., Pedowitz, M., Prakash, G., Ali, A., **Daniels, K.**, Myers-Ward, R., Murphy, T., Drew, H. "Terahertz Antenna Impedance Matched to a Graphene Photodetector", Under Review Nano Letters

II.F. Sponsored Research and Programs – Administered by the Office of Research Administration (ORA)

List source, title, amount awarded, time period and role (i.e., principal investigator or co-investigator) in reverse chronological order or its inverse. If there are co-investigators, please list them.

Summary: $2.89M ($2.17M to PI) in total funds as independent PI and co-PI

II.F.1. Grants

Grant 310885-0001 06/11/2023-06/11/2025
National Philanthropic Trust (Flu Lab LLC) Amount: $1,348,455 (88%)
Role: PI (D. Milton, co-PI)
"Immobilization of Broad and Specific Influenza Antibodies on Quasi-Freestanding Epitaxial Graphene Biosensors for the Rapid, Sensitive Detection of Circulating Influenza"

Grant 306871-0001 02/01/2022-01/31/2027
NSF CBET/BIOSENS Amount: $550,000 (100%)
Role: PI
"CAREER: Real-Time, Selective Gas Sensing in Complex Gas Compositions by Molecular Sieving via Robust Two-Dimensional Heterostructures"

Grant 306871-0002 02/01/2022-01/31/2027
NSF CBET/BIOSENS Amount: $60,004 (100%)
Role: PI
SUPPLEMENT "CAREER: Real-Time, Selective Gas Sensing in Complex Gas Compositions by Molecular Sieving via Robust Two-Dimensional Heterostructures"

Grant 304907-0001
Telophase Corporation 04/02/2021-08/31/2022
Role PI Amount: $101,206 (100%)
"Fabrication, Functionalization and Testing of Graphene-Based Volatile Organic Compound Sensors," Sponsored by Telophase

Grant 029842-00001 09/15/2018-08/31/2022
NSF/ECCS Amount: $606,237
Role: co-PI (T. Murphy, PI; E. Waks, co-PI; M. Leite, co-PI) Share: $151,559
"MRI: Development of Ultrafast Near-Field Scanning Optical Microscope,"

II.F.2. Contracts

Laboratory for Physical Sciences 04/08/2021-Present
Role: PI Amount: $103,965 (100%)

II.G. Gifts, and Funded Research not administered by ORA

II.G.1. Gifts *(solicited and in-kind funds)*

UM Ventures 03/03/2021-Present
MDDF- Coronavirus Medical Device Challenge Program Amount: $50,000 (100%)
Role: PI
"Epitaxial Graphene based Biosensor for Rapid Detection of COVID-19"

Teaching Innovation Grant 06/24/2020-8/30/2020
Role: PI Amount: $7,185.65 (100%)
"Teaching Innovation Grant: Revision of ENEE 416: Integrated Circuit (IC) Fabrication Laboratory"

Minta Martin 05/01/2018-04/31/2018
Role: PI Amount: $75,000 (100%)
"Transition Metal Oxide-Epitaxial Graphene Heterostructures for Real-Time Sensing by Molecule and Ion Trapping"

II.H. Research Fellowships, Prizes and Awards

2022	NSF CAREER Award
2022	UM Ventures Invention of the Year Finalist
2020	McNair Scholar Mentor Award
2014-2017	National Research Council Postdoctoral Fellowship
2014	Outstanding Research Assistant (Electrical Engineering, University of South Carolina)
2012	Member of US Delegation to the 62nd Lindau Meeting of Nobel Laureates and Students in Physics
2010-2014	Southern Regional Education Board Fellowship
2010-2014	African American Professors Program Fellowship
2009-2014	South East Alliance for Graduate Education and the Professoriate Fellowship
2009	Discovery Day 2009- Second Place Poster Presentation
2008	SCAMP Research Conference –Second Place Oral Presentation

2008	Discovery Day 2008- Second Place Poster Presentation
2007-2008	Magellan Scholar-University of South Carolina
2006-2009	South Carolina Alliance for Minority Participation Research Grant

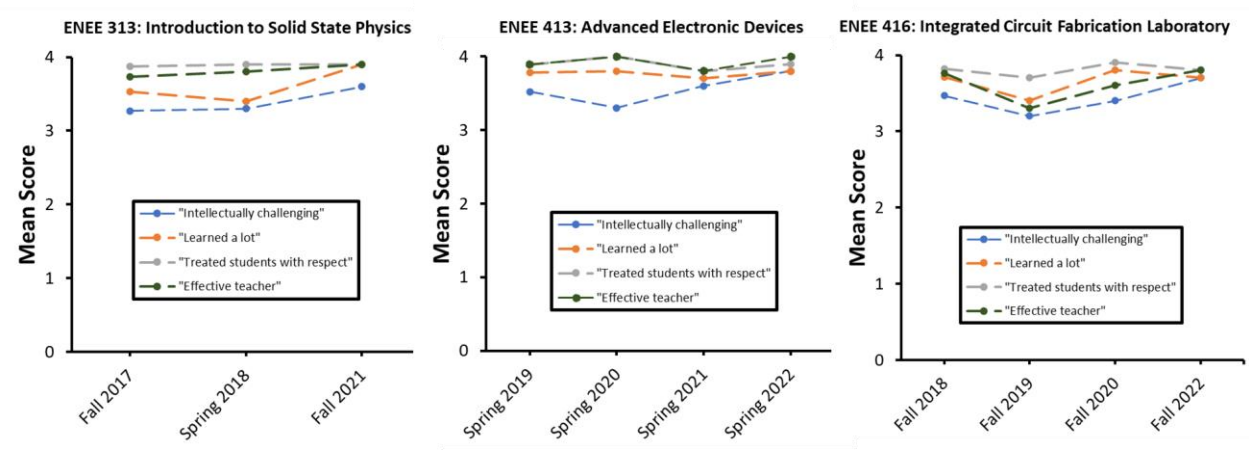
III. Teaching, Extension, Mentoring, and Advising

III.A. Courses Taught

ENEE Undergraduate Courses

- ENEE 416, Fall 2022, Integrated Circuit Fabrication Laboratory.
  - ENEE elective course (N=23)
- ENEE 413, Spring 2022, Advanced Electronic Devices.
  - ENEE elective course (N=38)
- ENEE 313, Fall 2021, Introduction to Device Physics.
  - ENEE undergraduate core course (N=50)
- ENEE 413, Spring 2021, Advanced Electronic Devices.
  - ENEE elective course (N=29)
- ENEE 416, Fall 2020, Integrated Circuit Fabrication Laboratory.
  - ENEE elective course (N=24)
- ENEE 413, Spring 2020, Advanced Electronic Devices.
  - ENEE elective course (N=31)
- ENEE 416, Fall 2019, Integrated Circuit Fabrication Laboratory.
  - ENEE elective course (N=24)
- ENEE 413, Spring 2019, Advanced Electronic Devices.
  - ENEE elective course (N=29)
- ENEE416, Fall 2018, Integrated Circuit Fabrication Laboratory.
  - ENEE elective course (N=17)
- ENEE 313, Spring 2018, Introduction to Device Physics.
  - ENEE undergraduate core course (N=40)
- ENEE 313, Fall 2017, Introduction to Device Physics.
  - ENEE undergraduate core course (N=16)

ENEE Undergraduate Course Evaluations



Master's, Pre-Candidacy, and Doctoral Candidate Research

- ENEE898 5801 (Fall 2022), Pre-Candidacy Research. (N=3)

- ENEE899 5801 (Fall 2022), Doctoral Dissertation Research. (N=1)
- ENEE898 5801 (Spring 2022), Pre-Candidacy Research. (N=2)
- ENEE899 5801 (Spring 2022), Doctoral Dissertation Research. (N=1)
- ENEE898 5801 (Fall 2021), Pre-Candidacy Research. (N=3)
- ENEE898 5801 (Spring 2021), Pre-Candidacy Research. (N=2)
- ENEE898 5801 (Fall 2020), Pre-Candidacy Research. (N=2)
- ENEE799 5801 (Spring 2020), Master's Thesis Research. (N=1)
- ENEE898 5801 (Spring 2020), Pre-Candidacy Research. (N=1)
- ENEE898 5801 (Fall 2019), Pre-Candidacy Research. (N=1)
- ENEE898 5801 (Fall 2018), Pre-Candidacy Research. (N=1)

Graduate Independent Study in Electrical Engineering

- ENEE699 5801 (Spring 2022), Independent Studies in Electrical Engineering. (N=1)
- ENEE699 5801 (Spring 2019), Independent Studies in Electrical Engineering. (N=1)

Undergraduate Senior Projects in Electrical and Computer Engineering

- ENEE499 0801 (Fall 2021), Senior Projects in Electrical and Computer Engineering. (N=1)
- ENEE499 0278 (Summer 2 2019), Senior Projects in Electrical and Computer Engineering. (N=1)
- ENEE499L 0179 (Summer 1 2019), Senior Projects in Electrical and Computer Engineering. (N=1)

Undergraduate Special Problems in Materials Science and Engineering

- ENMA698 2202 (Spring 2019), Special Problems in Materials Science and Engineering. (N=1)

Ronald E. McNair Scholars Program

- UNIV339 CP01 (Summer 1 2022), McNair Research Methods and Writing. (N=12)

III.B. Teaching Innovations

- ENEE 313: Introduction to Device Physics course revisions (2021, 2018, 2017):

  Created slide decks for the course material that are shared with students and colleagues.

  Created weekly extra credit quizzes that assesses students understanding of course material, and gives weekly feedback for students to ask questions.

- ENEE 413: Advanced Electronic Devices course revisions (2022, 2021,2020,2019):

  Created slide decks for the course material that are shared with students and colleagues.

Created weekly extra credit quizzes that assesses students understanding of course material, and gives weekly feedback for students to ask questions.

Created a new project on metal oxide semiconductor capacitors, where students design and simulate the performance of their device involving analytical calculations and simulations using NanoHub.

- ENEE 416: Integrated Circuit (IC) Fabrication Laboratory course revisions (2020):

  Challenge addressed: With the impact of COVID-19 unknown for the Fall 2020 semester, it was imperative to develop contingency plans of instruction if in-lab instruction is not possible. Successful instruction of ENEE 416 has always hinged on the dissemination of not only the theoretical aspects of device fabrication, but the practical, hands-on exposure to the processes, techniques, and equipment that students pursuing careers in microelectronics will need to be successful, and marketable to employers.

  Solution: Revisions to the course included:

  (1) a mask design project using free software KLayout (klayout.de), where students learned mask design, the patterns used to build devices layer by layer, over the course of two lectures and

  (2) the development of device fabrication videos where students can see the impact of fabrication decisions at crucial fabrication steps.

  Long-term impact: The videos are an excellent companion to future classes even when not threatened by COVID-19. These videos have been used in the Fall 2020, 2021, and 2022 offerings of the class as well as Gary Rubloff's class in Materials Science & Engineering ENMA 466: Advanced Materials Fabrication Laboratory. The inclusion of the mask design project equips our students with an additional skill that is useful for job marketability and success in graduate programs.

III.B.1. Course or Curriculum Development

- ENEE 419M: Advanced Manufacturing Laboratory

  Co-created with Prof. Reza Ghodssi; An interdisciplinary course designed to provide students with an overview of key processes, technology, and manufacturing techniques involved in fabricating advanced devices and systems. Students will be exposed to state-of-the-art fabrication technologies including soft lithography, 3D printing, hybrid manufacturing, material functionalization, and systems integration. In addition to developing a theoretical understanding in the classroom, students will gain hands-on fabrication and characterization experience of systems that can interface with complex environments.

<u>III.C.</u> <u>Advising</u>: Research or Clinical

III.C.1. Undergraduate

Current Undergraduate Researchers

- Advisor; Brandon Trotter (June 2023 - Present). REU student. Georgia State University.

Past Undergraduate Researchers

- Advisor; Michael Pedowitz (March 2018-August 2019). Current Graduate Student in Daniels Lab
- Advisor; Ebuka Ihejirika (September 2018 - December 2018).
- Advisor; Umar Okunade (September 2018 - December 2018).
- Advisor; Weijian Xian (January 2019 - June 2019). Current Graduate Student in Daniels Lab
- Advisor; Brendan Jordan (September 2019- August 2020). Current Graduate Student in Daniels Lab
- Advisor; Vu Tran (January 2019 - July 2019). Master's from UMD;
  Assistant Consultant, Electrical Engineer at WSP USA
- Advisor; Samir Kabir (January 2019 - February 2021).
  Product Specialist, Physical Measurements at Shimadzu Scientific Instruments
- Advisor; Jerome Quenum (January 2019 - August 2019). UMD University Medalist; Ph.D. Student at UC Berkeley (2024)
- Advisor; Stephen Pfeiffer (January 2019 - August 2019). Masters of Science from Johns Hopkins University (2023);
  Electrical Engineer at Johns Hopkins University Applied Physics Laboratory
- Advisor; Sumaiyah Sarwat (March 2019 - August 2019).
- Advisor; Matthew Juergensen (August 2019 - February 2020).
- Advisor; Chris Scalzi (September 2019 - March 2020).
  Firmware Engineer at Lockheed Martin
- Advisor; Matthew Miller (October 2019 - July 2020).
  PhD student at University of California
- Advisor; Gavin Courtright (May 2020 - August 2020). REU student. B.S from UMB (2021). Regulatory Engineer at the Maryland Department of the Environment

- Advisor; Leon Stevenson (July 2020 - December 2021).
  Employee at Applied Physics Laboratory. Current Ph.D. Student in Daniels Lab

- Advisor; Kendra Rivers (May 2021 - August 2021). Suffolk County Community College.

- Advisor; Aimen Khan (May 2022 - August 2022). Swarthmore College.

- Advisor; Kerdeem Farrell (June 2022 - September 2022).

- Advisor; Zoe Muneses (November 2022 -May 2023).

- Advisor; Elias Kallon (June 2021 – May 2023). Received B.S. in MSE at UMD (Dec. 2022). Incoming doctoral student at Northwestern (Fall 2023)

III.C.2. Master's

- Committee Member; Falco, Samantha Rose M.S. ENGR: MS/PhD-Electrical Engineering (August 1, 2022).

- Committee Member; Xu, Kezhen M.S. ENGR: MS/PhD-Electrical Engineering (October 23, 2019).

- Committee Member; Baum, Ittai M.S. ENGR: MS/PhD-Electrical Engineering (July 16, 2019).

III.C.3. Doctoral

Past Doctoral Researchers in Daniels Lab

- Advisor; Ihteyaz Avash (August 2018-January 2023).
  Was asked to leave the group due to poor performance. Currently pursuing Master's degree.

- Advisor; Guy Cassuto (February 2018 - August 2019).
  Left program due to medical reasons. Currently Senior Reliability Engineer at Medtronic

- Committee Chair, Advisor; Alexander Mazzoni (October 2021 - January 2023).
  Defended in Dec. 2023. Currently a researcher at the U.S. Army Research Laboratory (Jan. 2023-Present)

Current Doctoral Researchers in Daniels Lab

- Daniel Lewis (February 2018 - Present).

- Michael Pedowitz (August 2019 - Present).

- Brendan Jordan (August 2020 - Present).

- Jennifer DeMell (January 2021 - Present).
- Weijian Xian (June 2022 - Present).
- John Herboczek (August 2022 - Present).
- Leon Stevenson (August 2022 - Present).

Doctoral Dissertation Committees

- Committee Member; Stine, Justin Ph.D. ENGR: MS/PhD-Electrical Engineering (June 2023).
- Committee Member; Nouketcha, Franklin L Ph.D. ENGR: MS/PhD-Electrical Engineering (August 1, 2022).
- Committee Member; Cui, Yumeng Ph.D. ENGR: MS/PhD-Electrical Engineering (December 20, 2021).
- Committee Member; Park, Yongwan Ph.D. ENGR: MS/PhD-Electrical Engineering (August 20, 2021).
- Committee Member; Singh, Akshay Ph.D. ENGR: MS/PhD-Electrical Engineering (August 20, 2021).
- Committee Member; Chung, Jooik Ph.D. ENGR: MS/PhD-Electrical Engineering (May 21, 2021).
- Committee Member; Dutta, Subhojit Ph.D. ENGR: MS/PhD-Electrical Engineering (May 21, 2021).
- Committee Member; Nguewou-Hyousse, Helene Nya Chima Ph.D. ENGR: MS/PhD-Electrical Engineering (May 21, 2021).
- Committee Member; Darmody, Christopher James Ph.D. ENGR: MS/PhD-Electrical Engineering (August 21, 2020).
- Committee Member; Zou, Shenli Ph.D. ENGR: MS/PhD-Electrical Engineering (August 21, 2020).
- Committee Member; Aghaeimeibodi, Shahriar Ph.D. ENGR: MS/PhD-Electrical Engineering (May 22, 2020).
- Committee Member; Krayer, Lisa Ph.D. ENGR: MS/PhD-Electrical Engineering (May 22, 2020).
- Committee Member; Kim, Hyun Soo Ph.D. ENGR: MS/PhD-Electrical Engineering (December 17, 2019).

- Committee Member; Zhang, Zeyu Ph.D. ENGR: MS/PhD-Electrical Engineering (December 17, 2019).

- Committee Member; Shahriar Aghaeimeibodi Ph.D. Electrical and Computer Engineering (December 11, 2019).

- Committee Member; Lisa Krayer Ph.D. Electrical and Computer Engineering (November 15, 2019).

- Committee Member; Hyun-soo Kim Ph.D. Electrical and Computer Engineering (September 13, 2019).

- Committee Member; Lu, Jiangheng Ph.D. ENGR: MS/PhD-Electrical Engineering (August 16, 2019).

- Committee Member; Uma Sankar, Arun Sankar Ph.D. ENGR: MS/PhD-Electrical Engineering (August 16, 2019).

- Committee Member; Yao, Yangyi Ph.D. ENGR: MS/PhD-Electrical Engineering (August 16, 2019).

- Committee Member; Zeyu Zhang Ph.D. Electrical and Computer Engineering (August 12, 2019).

- Committee Member; Arun Sankar Uma Sankar Ph.D. Electrical and Computer Engineering (June 26, 2019).

- Committee Member; Mallik, Ayan Ph.D. ENGR: MS/PhD-Electrical Engineering (May 24, 2019).

- Committee Member Yes; Jiangheng Lu Ph.D. Electrical and Computer Engineering (May 2, 2019).

- Committee Member; Yangyi Yao Ph.D. Electrical and Computer Engineering (April 30, 2019).

- Committee Member; Xiao, Ziyang Ph.D. ENGR: MS/PhD-Electrical Engineering (December 18, 2018).

III.C.4. Post-doctoral

<u>Past Post-doctoral Fellows</u>

- Advisor; Soaram Kim (November 2018 - January 2022).
  Currently an Assistant Professor at Texas A&M University (Jan. 2023 - Present)

III.C.5. Other Directed Research *(e.g. K-12 Interactions)*

Past High School Interns

- Advisor; Osvaldo Hernendez (August 2021 - May 2022). Eleanor Roosevelt High School. Salutatorian. Currently studying chemical engineering at Cornell University.

- Advisor; Olawale Adurota (August 2022 – May 2023). Eleanor Roosevelt High School.

III.D. Professional and Extension Education

III.D.1. Guest Lectures *(Presented in traditional classes or for someone else's program)*

- Daniels, K. M., ENEE 101: Introduction to Electrical and Computer Engineering Guest Lecture, Electrical and Computer Engineering Department, University of Maryland, "Introduction to Semiconductor Devices" (Apr. 2019)

- Daniels, K. M., ENEE 101: Introduction to Electrical and Computer Engineering Guest Lecture, Electrical and Computer Engineering Department, University of Maryland, "Introduction to Semiconductor Devices" (Dec. 2017)

- PHYS 485/685 Guest Lecture for Dan Lathrop (Oct. 2017)

III.E. Teaching Awards

- George Corcoran Award, Department of Electrical and Computer Engineering, University of Maryland. Teaching. (2019)

IV. Service and Outreach

IV.A. Editorships, Editorial Boards, and Reviewing Activities

Include participation for journals and other learned publications (print and electronic).

IV.A.1. Editorial Boards

- Special Issue Editor, Progress in Biophysics and Molecular Biology. (June 2022 - Present).

IV.A.2. Reviewing Activities for Journals and Presses

- Reviewer, Nanomaterials. (January 2022 - Present).

- Reviewer, Sensors. (December 2021 - Present).

- Reviewer, Molecules. (November 2021 - Present).

- Reviewer, Nanoscale. (November 2021 - Present).

- Reviewer, Journal of Alloys and Compounds. (April 2021 - Present).

- Reviewer, Biomedical Microdevices. (January 2021 - Present).

- Reviewer, Electron Device Letters. (March 2020 - Present).
- Reviewer, Journal of Applied Physics. (December 2019 - Present).
- Reviewer, Physics Letter A. (December 2019 - Present).
- Reviewer, Superlattices and Microstructures. (December 2019 - Present).
- Reviewer, International Journal of Hydrogen Energy. (October 2019 - Present).
- Reviewer, International Journal of Hydrogen Energy. (January 2019 - Present).
- Reviewer, Nano Letters. (August 2018 - Present).

IV.A.3. Reviewing Activities for Agencies and Foundations

- Reviewer, National Science Foundation
  Panel (Apr. 2023)-Electrical, Communications and Cyber Systems (ECCS)
  Panel (Sept. 2022)-Small Business Innovation Research
  Panel (Apr. 2021)- DMREF Photonic Materials and Devices
  Panel (Jan. 2020)- DMR Electronic and Photonic Materials
  Panel (April 2019)- Electronics, Photonics and Magnetic Devices
- Reviewer, Department of Defense: Science, Mathematics, and Research for Transformation January 2019.

IV.A.4. Reviewing Activities for Conferences

- Technical Reviewer, Electronic Materials Conference (EMC)
  - 65th Electronic Materials Conference (2023)
  - 64th Electronic Materials Conference (2022)
  - 63rd Electronic Materials Conference (2021)
  - 62nd Electronic Materials Conference (2020)
- Reviewer, Hilton Head Solid-State Sensors, Actuators, and Microsystems Workshop (2022)
  - Hilton Head (2024)
  - Hilton Head (2022)
- Reviewer, 6th 2D Symposium in 23rd American Conference on Crystal Growth and Epitaxy (ACCGE-23) and the 21st US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-21). (2023)
- Reviewer, 5th 2D Symposium in 22nd American Conference on Crystal Growth and Epitaxy (ACCGE-22) and the 20th US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-20) (2021)

- Reviewer, 4th 2D Symposium in 19th International Conference on Crystal Growth and Epitaxy (ICCGE-19) and the 19th US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-19) (2019)

IV.A.5. Other

IV.B. Committees, Professional & Campus Service

IV.B.1. Campus Service – Department

- Member, Graduate Studies and Research Committee (ENGR-Electrical & Computer Engineering). May 2021 - Present.
- Member, Salary Committee (ENGR-Electrical & Computer Engineering). May 2021 - Present.
- Member, FY23 IREAP Merit Review Committee (CMNS-IREAP-Inst Res Elec & Applied Phys). March 2022 - April 2022.
- Chair, Facilities and Services Committee (ENGR-Electrical & Computer Engineering). May 2019 - May 2021.
- Member, IREAP Executive Committee (CMNS-IREAP-Inst Res Elec & Applied Phys). September 2018 - September 2020.
- Member, Human Relations and Welfare Committee. May 2019 - May 2020.

IV.B.2. Campus Service – College

- Senator, College Senate, A .James Clark School of Engineering (ENGR-A. James Clark School of Engineering., May 2023-Present.
- Marshal for Commencement, A. James Clark School of Engineering (ENGR-A. James Clark School of Engineering). 2018 - Present. (Spring 2018, Fall 2018, Spring 2019. Fall 2019, Spring 2022, Spring 2023)
- Member, QTC Search Committee (ENGR-A. James Clark School of Engineering). August 2018 - April 2019.

IV.B.3. Campus Service – University

- Judge, 2022 Ronald E. McNair Academic Achievement Programs' 2022 Summer Research Institute
- Judge, 2019 USM PROMISE Symposium AGEP Research Symposium & Professional Development Conference. February 2019.

IV.B.4. Offices and Committee Memberships

- Committee Member, 2024 Hilton Head Solid-State Sensors, Actuators, and Microsystems Workshop April 2023 - June 2024.

- Committee Member, Electronic Materials Conference (EMC)
  - 65th Electronic Materials Conference (2023)
  - 64th Electronic Materials Conference (2022)

- Committee Member, 2022 Hilton Head Solid-State Sensors, Actuators, and Microsystems Workshop April 2021 - June 2022.
  - Awards Committee

IV.B.5. Leadership Roles in Meetings and Conferences

- Treasurer, Electronic Materials Conference (2023-2024)

- Chairperson, 6th 2D Symposium in 23rd American Conference on Crystal Growth and Epitaxy (ACCGE-23) and the 21st US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-21). (2023)

- Chairperson, 5th 2D Symposium in 22nd American Conference on Crystal Growth and Epitaxy (ACCGE-22) and the 20th US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-20) (2021)

- Co-Chair, 4th 2D Symposium in 19th International Conference on Crystal Growth and Epitaxy (ICCGE-19) and the 19th US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE-19) (2019)

IV.C. Community & Other Service

- Speaker, Career Day, Cradlerock Elementary School, Howard County Public School System (2023)

- Judge, 2023 Eleanor Roosevelt High School STEM Fair, Eleanor Roosevelt High School

- Research Mentor and Host, Science and Technology Center, Eleanor Roosevelt High School (2022-2023, 2021-2022)

- Judge, Project Lead the Way (PLTW) Engineering Program, Senior Capstone Projects, Howard County Public School System (2019-2020)