Brendan Cusack
5141 Dudley Lane, Bethesda, MD 20814 | (240)-644-2450 | brendan.cusack@coolcadelectronics.com

Brendan Cusack is a former materials processing engineer at CoolCAD Electronics, where he led the team that implements the silicon carbide micro-fabrication processing in the cleanroom. During his time at CoolCAD, Cusack implemented the process engineering for silicon carbide MOSFETs, JFETs, photodiodes, avalanche photodiodes, and integrated circuitry. He has developed in-house techniques for activation, oxidation, wet/dry etching, and several other silicon carbide and germanium specific process techniques. Since leaving CoolCAD, Cusack has started a private SAT/ACT Prep company that also focuses on STEM education for undergraduates. He spends his days developing curriculum and his evenings/weekends elucidating core STEM and English principles to students. He has received perfect SAT scores and has fantastic command of English language.

Education

University of California, Los Angeles
Masters of Science in Engineering – Electronic Materials (3.6 GPA) March 2019

University of Maryland, College Park, MD May 2012
Bachelors of Science, Chemistry (3.5 GPA)

MIT XPRO – Full Stack Development with MERN October 2021

Founder and President, Cusack Prep LLC, Bethesda, MD Jan 2018 - present

- Developed Curriculum for SAT/ACT Program
- Helped over 200 students study for high school course, college courses, and standardized tests
- Currently teaches ~50 students in a wide range of science and math courses
- Perfect 1600 SAT Score (November 2018)
- Perfect 800s on Math level 2, physics, and chemistry subject tests (October 2018)
- GRE Score 168 Quant 163 Verbal
- GMAT Score 750
    - 41 Verbal
    - 50 Quant
    - 6.0 Analytical Writing
    - 8 Integrated Reasoning
- Proficient in HTML, CSS, JavaScript and Python programming languages.

Materials Processing Engineer, CoolCAD Electronics, College Park, MD Jun 2014 – June 2017

- Lead the development and fabrication of silicon carbide, germanium and SOI nanodevices
    - Silicon Carbide
        - Led the Fabrication Process Implementation for several silicon carbide devices across multiple NASA, DARPA, and ARL contracts including:
        - Performed extensive optical and electrical characterization of devices
        - Devised numerous novel silicon carbide processing procedures to achieve devices:
            - Surface cleaning techniques for silicon carbide
            - Silicon carbide reactive ion etching recipes
            - Silicon carbide surface passivation techniques
            - Silicon carbide capping and annealing techniques for dopant activation
    - Germanium
        - Reduced sidewall leakage by 2 orders of magnitude through varying sidewall passivation and etching techniques.
        - Developed Novel technique to form low resistive contacts to n-type Germanium

    - Developed silicon carbide MESA and planar photodiode structures
- Assisted in performing Radiation Testing at Los Alamos National Laboratory to determine radiation hardness of silicon carbide and gallium nitride power devices to terrestrial neutrons
- Provide regular chemistry lectures to engineering staff and executives
- Worked various in Class 1000 Fabrication Lab at NIST, University of Maryland, and Laboratory of Physical sciences

Founder and President, Alpha Educators, Beltsville MD January 2013- 2018

- Founded a private education company dedicated to enriching students with supplementary science and math tutoring services after school
- Personally worked with over 100 students in high school and college courses including chemistry, physics, and mathematics
- Devised methods to prepare students for SAT and ACT exams
- Hired and trained 15 tutors to grow and enhance Alpha Educator's ability to serve our clients' needs
- Experienced at least 50% year over year growth for each year between 2013 and 2016.

Publications

A. Akturk, B. Cusack, N. Goldsman, "Large Area Silicon Carbide Photodiode, and Monolithic Readout Design and Fabrication", Materials Science Forum, Vol. 858, pp. 1023-1027, 2016

A. Akturk, N. Goldsman, A. Ahyi, S. Dhar, B. Cusack, M. Park, "SPICE Modeling of Advanced Silicon Carbide High Temperature Integrated Circuits", Materials Science Forum, Vol. 858, pp. 1070-1073, 2016

Conference Presentations

Cusack, BM., Akturk, A., Goldsman, N., Dilli, Z., Gross, M., 2016. Silicon Carbide Device Fabrication and Product Line Development, International Semiconductor Device Research Symposium, Bethesda, MD, Dec. 8 2016.

Cusack, BM., Akturk, A., Goldsman, N., Dilli, Z., Gross, M.. 2016. Germanium Mesa Photodiode Development and Readout Circuit, International Semiconductor Device Research Symposium, Bethesda, MD, Dec. 9 2016.

Patents

A. Akturk, B. Cusack, N. Goldsman, "Silicon Carbide Integrated Circuit Design and Fabrication Incorporating Linear and Avalanche Photodetectors, JFET and MOSFET Devices and Passive Devices," Provisional Patent Application Number 62267620, 12/15/2015.

Goldsman, N., Akturk, A., Dilli, Z., Cusack, B. and Gross, M., "Silicon Carbide Integrated Circuit Active Photodetector," U.S. Provisional Patent Application, no. 62/431,356, 2016

Math Courses Taken

AP Calc BC credit
Multivariable Calculus
Differential Equations
Intro to Statistics
Familiar with early Linear algebra principles