Cameron McElfresh

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GRE: Verbal:167, Quant: 165

Education

University of California, Los Angeles
Ph.D in Materials Science and Engineering – June 2022
Major GPA: 4.0

UCLA Departmental Fellowship
UCLA Technology Development Group - New Ventures Fellow

University of California, San Diego
MS in NanoEngineering – June 2018
Major GPA: 3.8

grAdvantage Leadership Program

University of California, San Diego
BS in NanoEngineering - June 2017
Minors in Mathematics and Economics
Major GPA: 3.8 Overall GPA: 3.6

UCSD LAUNCH Scholar (2013-2015)
Provost Honor Roll: 5 Quarters
Athletic Director's Honor Roll: 12 Quarters
Athletic Director's Honor Roll Gold: 1 Quarter
Charles R. Walgreens Junior Scholarship (2014)

Research/Internship Experience

Jaime Marian Research Group, University of California Los Angeles - Materials Science & Engineering **2018-Present**

Current projects include; developing a vacancy-diffusion model to simulate climb velocities for high-temperature creep, dislocation avalanche modeling in single-crystal nanopillar deformation, non-traditional W-O diffusion pathways, and deformation modeling of metallic foams for heat shields. Mentored, trained, and supervised masters students. Research group focuses on understanding materials evolution under extreme conditions (high temperature, rapid loading, irradiation etc.) through development of multiscale computational models.

- Density Functional Theory (DFT)
- Dislocation Dynamics (DD)
- Monte Carlo (MC)
- XRD
- Kinetic Monte Carlo (KMC)
- C++
- MATLAB
- SEM/EDS
- Python
- Linux
- Materials Characterization
- Optical Microscopy

Kenneth Vecchio Research Group, University of California San Diego - NanoEngineering **2014-2018**

Designed and built equipment to observe the plasma channel in short-range liquid dielectric breakdowns. Performed spark-plasma-sintering synthesis of metals and ceramics for high-strength materials. Optimized liquid-mediated (ethanol, LN2) spark erosion and recover nanopowders (316L Steel, Hf, Ni, W, brass, graphite). Used MATLAB for processing of large data sets, simulation of XRD patterns of new high-entropy materials. Investigated the performance of a new multispectral nanoparticle tracking technique (MANTA, CA) to measure complex nanoparticle size distributions. Design and fabricated parts for lab or machine modification through SolidWorks and G-Code or hand machining. Research group focuses on engineering high-performance structural materials by means of manipulating microstructural and composition factors as well as applying novel processing methods.

- MATLAB
- Spark-Plasma Sintering
- Spark Erosion Synthesis
- Grinding/Polishing/Etching
- SEM/EDS/EBSD
- G-Code
- 3-Axis Milling/Lathing
- High-Speed Imaging
- GND/Misorientation Analysis
- Mechanical Testing
- SolidWorks
- Plasma Spectroscopy

Senior Design Project, University of California San Diego - NanoEngineering **2017**

Advisor: Ph.D. David Fenning

Designed high-throughput, low-cost, sustainable ZnO-MWCNT transparent conducting films (TCFs) to replace ITO as an efficient and sustainable alternative for performance electronics and solar cells. Optimized the application and spray coating synthesis of the TFCs through solvent engineering and experimental design. Successfully synthesized continuous conductive ZnO-MWCNT matrix on Si wafers with functional transparency and uniform nature.

- Spray Coating
- 4-Point Probe Measurements
- Spectroscopy Analysis
- SEM/Optical Microscopy

Research Intern, PhEnVoGen, San Diego CA **2016-2018**

CEO: Ph.D. Phillip Jaeger

San Diego start-up investigating the use of high-dimensional data sets from yeast assays for the development of experiment driven molecular databases that link genes and drugs that affect phenotypes to a predicative "Genespeak" algorithm. Initial NIH funding of $225,000 (Spring 2017). Primary wetlab scientist in planning, scaling, and executing large scale yeast assays to evaluate the physical and microbiological response to various environmental factors such as drug-based media and nanoparticle saturated conditions.

- High-Throughout Yeast Assays
- Biochemical/Biophysical Testing
- TECAN EVO Programming
- Gel Electrophoresis
- Agar/Phytagel Plate Preparation
- PCR
- Yeast Library Management
- Plating/Streaking

Leadership

JUMP Mentor **2017-2018**

Provided support, advice, guidance, and experience to a group of undergraduate engineering students. Helped construct individual plans for students' professional and academic goals. Assisted with network development, reaching out to research advisors, and resume and cover letter polishing.

Captain, NCAA Men's Soccer, University of California San Diego **2013-2016**

Captain for the NCAA men's soccer team and maintained academics, morale, positive group dynamics, and leadership growth within the team. Nominated for and participated in a 10-week intensive leadership course directed by sports psychologist Rhonda Hackshaw. Helped lead the UCSD team to the NCAA semi-finals and set the UCSD in-season shut out record. Coached at the UCSD summer soccer camps (2014, 2015). Won NSCAA First Team All-American (2016), NCAA Consensus All-American First Team (2016), NSCAA Scholar Player of the Year (2016), UCSD Athlete of the Year (2016), National Student Athlete Day – Recognized (2016), San Diego Hall of Champions (2016), CCAA Defensive Player of the Year (2016), CCAA All-Academic (2012, 2014, 2015, 2016).

President, Tau Kappa Epsilon **2014-2016**

Enhanced relations with administration, student organizations, and alumni. Rewrote the chapter bylaws to incorporate safety policies that required CPR and first aid training of supervising members. Created policies for third-party oversight of the $100k chapter budget. Organized our largest-ever philanthropy and donated the $5,000 profits to St. Jude's Children's Hospital. Spearheaded the development an annual alumni job fair and mixer. Recognized nationally for best recruiting (2015). Raised quarterly chapter GPA (80 members) by 0.15 by implementing restrictions on at-risk members and developing tutoring and study hour opportunities (2014). Recognized as emerging class leader freshman (2013, 2014) years and recognized for outstanding academic performance (2013). Assisted in nominating, campaigning, and awarding UCSD sweetheart (Mio White) to be the International Sweetheart of Tau Kappa Epsilon (2015).

Founder and Vice President of Data Analysis, Greeks Gone Green **2013-2014**

Devised a method to track the carbon footprint of Greek life by collecting mass survey data and extrapolating areas of waste. Used the analysis to provide recommendations on how to decrease the carbon footprint of the community. GGG actions led to policy changes that aim to promote a more sustainable community.

Other

New Ventures Fellow, UCLA Technology Development Group **2019**

Worked with both MedTech and Therapeutic track UCLA innovators to develop investor pitch decks. Performed due diligence on indication prioritization, unmet needs, patient segmentation, pricing potential, current standard of care, and market analysis. Assisted in creation of comprehensive deck to compete for $200,000 prize funding from UCLA Technology Development Group.

SPARK Program, Rady School of Business, University of California San Diego **2017-2018**

Selected for and participated in a 10-week intensive course designed by Rady business school to provide graduate students with the tools needed to develop ideas or products into realistic and launchable business models. Developed business model of an interface that provides tools to professors to enhance lectures and ease student-professor communication pathways.

Finalist, SMART Scholarship **2014**

DoD-based scholarship established to support students pursuing technical degrees in STEM disciples. Finalist of 2700 applicants but not selected as one of the ~25 Materials Science receiving awards.

Publications

1. PA. Jaeger**, C. McElfresh**, LR. Wong, T. Ideker. *Beyond agar: optimized gel substrates for microbial growth experiments*. Applied and Environmental Microbiology, 81(16): 5639-5649, Aug 2015.
2. PA. Jaeger, M. Paschini, GJ. Bean, L. Chen, B. Hsu, **C. McElfresh**, LR. Wong, V. Lundblad, T. Ideker. *The regulatory gene network of telomere length in yeast*. (in preparation).
3. **C. McElfresh**, T. Harrington, K. Vecchio. S*park erosion as a high-throughput method for producing bimodal nanostructured 316l stainless steel powders*. Powder Technology, (328): 156-166. April 2018.
5. **C. McElfresh**, T. Harrington, K. Vecchio. *Application of a novel new multispectral nanoparticle tracking technique*. Measurement Science and Technology, (29)6, April 2018.
6. PA. Jaeger, L. Ornelas, **C. McElfresh** LR. Wong, RY. Hampton, T. Ideker. *Systematic gene-to-phenotype arrays: a high-throughput technique for molecular phenotyping*. Molecular Cell, (69)2: 321-333, Jan 2018.
8. T. Harrington, M. Samiee, O. Dippo, K. Vecchio, **C. McElfresh**. J. Gild. *Synthesis and phase formation of refractory transition metal carbides.* Acta Materialia. (166): 271-280. March 2019.
9. T. Harrington, J. Gild, O. Dippo, K. Kaufman, K. Vecchio, **C. McElfresh**. *Phase stability and mechanical properties of novel high entropy transition metal carbides* Acta Materialia, (166): 271-280. March 2019.
10. **C. McElfresh**, L. Borowski, T. Harrington, K. Vecchio, G. Tynan. *Investigation of Liquid Spark Erosion Nanoparticle Fabrication Using High-Speed Imaging and Emission Spectroscopy* (Submitted to Journal of Applied Physics – in revision)