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BRANDON SCOTT CURTIS

PhD Candidate, UC Berkeley Chemical Engineering (expected graduation December 2016)
Laboratory of Dr. David Graves, Lam Research Distinguished Professor in Semiconductor Processing
B.S. Chemical Engineering (Bioprocessing Option); B.S. Biochemistry and Molecular Biology
Penn State University Schreyer Honors College - Graduated May 2011; GPA 3.88/4.00 (Dean's List)

Consulting Experience

University of California, Berkeley *Berkeley, CA*

Team Lead, BERC Innovative Solutions - Rebel Carbon/ARB **2015 (current)**
Leveraged UC Berkeley resources to perform market and technical analysis and evaluate product-market fit

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Technical Specialist, Cleantech To Market - NanoCatalystGTL **2015 (current)**
Contributing scientific and communication expertise to a startup accelerator in UC Berkeley's Haas School of Business
Employed hypothesis-based entrepreneurship techniques to evaluate IP applications in diverse markets

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Team Lead, BERC Innovative Solutions - iNDUSTRIAL MiCROBES **2015 (6 months)**
Coordinated team of three in a UC Berkeley-sponsored technical consulting program for an early-stage biotech startup
Evaluated next-stage industrial collaborators based on technical comparative advantage and market conditions

Subject Matter Expertise

Core ChemEng: thermodynamics, transport phenomena, organic chemistry, physical chemistry, analytical chemistry
Core Biochem: biochemistry, microbiology, enzymology, genetics, bioprocessing and biomolecular engineering
PhD Research: semiconductor device manufacturing, plasma physics, low-temperature plasmas, plasma biomedicine, spectroscopy (UV-Vis, FT-IR, OES), data acquisition and analysis, process control, embedded systems
Hobby Projects: microelectronics, high voltage power electronics, open source hardware and software, amateur radio

Graduate Thesis

"Process control for atmospheric pressure plasmas—extending applications in materials and biomedicine"
Implementing and evaluating hard and soft sensors—optical emission spectroscopy, optical thermometry, electrical characterization, acoustic techniques, power spectral analysis—for predicting and controlling the plasma etch rate, as measured by quartz crystal gravimetry (QCM) of thin polymer films at atmospheric pressure.

Technical Skills

Plasma Processing, Characterization, and Process Control
Atmospheric plasma-assisted chemical vapor deposition (system design/fabrication; electrical characterization)
Thin-film: Ellipsometry, Profileometry, AFM, ATR-FTIR || Gas-phase: optical emission spectroscopy, FTIR, UV-Vis
High-voltage AC/DC power supply design, fabrication, and electrical characterization
Sensor and controller hardware interfacing, data acquisition and analysis, PID and MPC process control
Linux client/server/web administration, version control (Git, Mercurial), analysis, simulation, statistics, and numerical methods in Python and Sage Math (open-source computer algebra), machine shop and microelectronics design

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Biomolecular & Bioprocess Engineering
Plant Tissue: aseptic clonal propagation, cell & root culture initiation and maintenance, *Agrobacterium* transformation
Microbial: culture of strict and facultative aerobes, microaerobes, anaerobes, phototrophs, lithotrophs, & etc
Microbial: molecular cloning in Rhodobacter and E. coli; culture and analytical methods for microalgae
Pilot-scale attachment-independent plant and mammalian cell culture and purification processing
Protein purification, spectroscopy, quantification, AKTA chromatography; Enzymatic assays; whole-cell biocatalysis
Basic synthetic organic chemistry and associated analytical methods (TLC, GC, NMR, IR, UV-Vis, Polarimetery)
Design, construction, and operation of novel low-cost, high-density plant and microbial bioreactors

Professional Certification

FCC Amateur Radio license — Amateur Extra class **2014**
Passed – NCEES Fundamentals of Engineering EIT (FE) Certification Exam **2009**

Honors & Awards

Lam Research Graduate Research Fellowship (full tuition and stipend support, 2 years);
National Science Foundation Graduate Research Fellowship (full tuition and stipend support, 3 years)

Publications

Air spark-like plasma source for antimicrobial NOx generation. http://goo.gl/nZWmsC
Advancing *Rhodobacter sphaeroides* as a platform for expression of functional membrane proteins. http://goo.gl/cqRcSt
Improving accuracy of cell and chromophore concentration measurements using optical density. http://goo.gl/AIJo0Q
Development of Rhodobacter for the Production of Functional Membrane Proteins. http://goo.gl/evPzvX

Research Experience

University of California, Berkeley — *Berkeley, CA*
Graduate Researcher, Laboratory of Dr. David Graves — **Aug 2013–Present**
Explored applications of atmospheric nonthermal plasmas for materials processing and surface disinfection
Constructed system for real-time monitoring and control of plasma gas & electrical properties using open platforms
Designed and built custom high-voltage AC and pulsed-DC power supplies for atmospheric plasma generation

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Joint Bioenergy Institute — *Emeryville, CA*
Research Assistant, Fuels Synthesis Division — **Sep 2011–2013**
Developed and optimized techniques for combinatorial assembly of DNA for transcription factor library construction
Prepared protocols utilizing liquid-handling robots for scale-up and automation of chemical library techniques

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The Pennsylvania State University — *University Park, PA*
Laboratory Technician / Undergraduate Researcher — **1996–2011**
Scaled up heterologous membrane protein expression using *Rhodobacter* in a novel photobioreactor system
Designed and built custom bioreactor gas/liquid handling and real-time monitoring systems for development work
Trained and coordinated a team of ten undergrads, grads, and interns across two disciplines and three institutions

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Genentech, Inc — *S. San Francisco, CA*
Process Development Engineering Intern — **May–Dec 2007**
Evaluated commercially-available online analytical technologies for use in Manufacturing Purification operations
Designed & executed experiments and recommended tech and procedure improvements to management and vendors
Supported bioreactor operation and sample analysis in mammalian cell culture–based analytical experiments

Teaching Experience

University of California, Berkeley — *Berkeley, CA*
Graduate Student Instructor — **2013–2014**
“Semiconductor Manufacturing Processes” (35 students): semiconductor materials, device physics, process design
“Biomolecular Engineering” (30 students): protein & metabolic engineering, drug delivery, synthetic biology

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The Pennsylvania State University — *University Park, PA*
Teaching Assistant / Teaching Intern — **2008–2011**
TA’ed courses in biomolecular (150 students), bioprocess (30 students), and energy (20 students) engineering
Wrote homework and tests, held office hours and review sessions, and frequently lectured independently

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PsuKnowHow Tutoring Service — *State College, PA*
Private Instructor — **Mar 2008–Oct 2009**
Provided one-on-one and large-group (100+) instruction to students in chemistry, biology, math and physics

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The Pennsylvania State University — *University Park, PA*
Web Design, Data Management, and Systems Administration — **2009–2013**
Managed a 20-computer research network to simplify and improve the use of information technology in the laboratory