# University of California, Santa Barbara
# Summer Undergraduate and Graduate Research Colloquium

**Thursday, August 11th 2016**
**9:30 – 11:30 am**

**Programs:** AIM Photonics Research Apprenticeship Program (AIM Photonics), California Alliance for Minority Participation (CAMP); Cooperative International Science and Engineering Internships (CISEI); Edison-McNair Scholars Program (Edison); Early Undergraduate Research and Knowledge Acquisition (EUREKA!); Future Leaders in Advanced Materials (FLAM); Gorman Scholars Program (Gorman); Institute for Collaborative Biotechnologies Summer Applied Biotechnology Research Experience (ICB SABRE); Mathematics Summer Research Program for Undergraduates (Math REU); Maximizing Access to Research Careers (MARC); McNair Scholars Program (McNair); Undergraduate Experience in Network Analysis and Synthesis (Network Science); Problem-Based Initiatives for Powerful Engagement and Learning in Naval Engineering and Science (PIPELINES); University of California Leadership Excellence through Advanced Degrees (UCLEADS)

| Poster Location | Program | Presenter | Title |
|---|---|---|---|
| 50 | AIM Photonics | Marco Cerrato | Digital Control Electronics For Optical Gyroscopes |
| 1 | AIM Photonics | Valentina Hallefors | Detection of Substances of Forensic Significance Using Microfluidics and SERS |
| 124 | AIM Photonics | Daniel Leon-Gijon | Characterization of Quantum Cascade Lasers on Silicon |
| 32 | AIM Photonics | Jonathan Madajian | Photonic Integrated Transmitter for Free Space Laser Communications |
| 52 | AIM Photonics | James McKenna | Thermo-Electric Control Board for Integrated Optical Beam Forming Network |
| 70 | AIM Photonics | Jesus Perez | Multimode Interference Waveguides |
| 89 | AIM Photonics | Moisses Rodriguez-Hernandez | Using Surface-Enhanced Raman Spectroscopy to Detect Biologically-Relevant Small Molecules |
| 117 | AIM Photonics | Micaela Saunders | Mach-Zehnder Interferometer Design for Optical Isolation |
| 120 | AIM Photonics | Franklin Tang | Microring Resonator Switches |
| 126 | AIM Photonics | Didiel Vazquez Morales | Preparing Templated Silicon Surface for III-V Epitaxy |
| 2 | AIM Photonics | Aditya Wadaskar | Simulating a Mach-Zehnder Silicon Photonic Switch |

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|---|---|---|---|
| 101 | CAMP | Rachel Alvelais | Electrochemical Production of Multi-Junction Nanorod Solar Cells |
| 26 | CAMP | Sebastian Arias | Optimization of DNA Nunchuck Seed Design for Accurate Measurements of DNA Bend Angle |
| 53 | CAMP | Victoria Arias | A Level-set Method for Solving Poisson Equations in Irregular Domains with Robin Boundary Conditions |
| 71 | CAMP | Karla Bernardo | Molecular Regulation of δ-catenin Protein Production in Neural Networks |
| 3 | CAMP | Amanda Caceres | Thermodynamics of Surface-Attached Protein Folding Towards a Quantitative Understanding of How Artificial Materials Affect Biomolecules |
| 4 | CAMP | Berenice Garcia | Studying the behavior of SiPMs |
| 69 | CAMP | Luis Limon | Incorporating Nitrogen Functionality Into Small Molecules by Utilizing a Radical Trap Cyclization Process |
| 25 | CAMP | Michelle Marin | Does a romantic partner's compassionate love predict the other partner's sense of feeling supported? Effects of compassionate love on empathy, responsive behavior, and perceived partner responsiveness |
| 51 | CAMP | Jacobo Pereira-Pacheco | Assessing the Effects of Nearshore Brushfires on Heavy Metal Concentrations in Mussels near Pitas Point, California |
| 88 | CAMP | Andrea Ramirez | The Role of Membrane Hydration in PEGylated Cationic Lipid Vectors for Targeted Gene Delivery |
| 116 | CAMP | Isaac Robledo | Modular Synthesis of Conjugated Polymers to Systematically Probe Self-Assembly |
| 90 | CAMP | Charlene Salamat | Temperature Controlled Electrodeposition for Low Platinum Loading on Proton Exchange Membrane Fuel Cells |
| 5 | CAMP | Catrina Wilson | Unraveling the Mechanism of Transition Metal Sulfide Conversion Electrodes with Local Structure Methods |
| 33 | CISEI | Ronja Anton | Investigating the thermodynamic behavior of Y-Si alloys for CMC applications |
| 68 | CISEI | Angus Braithwaite | Investigating amorphous-crystalline transformation in polymer-derived ceramics for applications in jet turbine engines |
| 6 | CISEI | Simon Blomé | 3D Printing of Ordered Two-Phase Composites |
| 54 | CISEI | Laureen de Bever | Excluded volume effects as probed by pulsed Electron Paramagnetic Resonance using spin-labelled PEG sensor. |
| 72 | CISEI | Linus Haglund | New experimental equipment for phosphor-converted solid state white lighting research |
| 83 | CISEI | Arthur Hussey | Structural Characterisation of Thin Film Barium Stannate Grown Using Molecular Beam Epitaxy |

| Poster Location | Program | Presenter | Title |
|---|---|---|---|
| 96 | CISEI | Kai Rochlus | Synthesis, Characterization, and Property Determination of the Novel Bismuth Cyanamide |
| 84 | CISEI | Lisa Sirén Gustafsson | Ionic gating of the electronic properties in Sr2IrO4 |
| 7 | CISEI | Martin van Son | Synthesis and characterization of hydrophilic-fluorinated block copolymers obtained via ATRP |
| 34 | Edison | Carina Bilodeau | Biotic and abiotic constraints on natural succession in old agricultural fields |
| 43 | Edison | Brian Canty | Controlling the Controller: Creating Auxiliary Systems to Aid in Characterizing Magnetic Levitation Engines |
| 8 | Edison | Veena Chandran | Stylometry: Linguistic Fingerprinting Using Machine Learning on SeekingAlpha |
| 57 | Edison | Teal Coppock | Small scale changes in drought tolerance of Stipa pulchra |
| 97 | Edison | Martin Grabau | Constructing a Rehabilitation Laboratory |
| 91 | Edison | Ryan Kaveh | Monitoring Cellular Interactions with High Resolution Thermography |
| 73 | Edison | Junqian Liu | Electrical Characterization of Etch Damage in GaN Trench MOSFETS |
| 103 | Edison | Calvin Louie | Expansion of the Morphable Mirror Telescope |
| 87 | Edison | Franklin Ly | Validating the Fast Sweeping Method for Seismic Wave Propagation Analysis |
| 67 | Edison | Maximilian Ochoa | Geologic History of Norway |
| 44 | Edison | Alejandra Santos | Lithium-polymer Battery Use in Low Pressure Environments |
| 45 | Edison | Paymon Shariat-Panahi | Hyperloop Levitation System Integration |
| 35 | EUREKA | Dillon Acker-James | Connections to the Big Bang: Circuit Boards for CERN |
| 9 | EUREKA | Michael Aling | Magnetic and Electronic Transitions in a Highly-Doped Mott Insulator |
| 74 | EUREKA | Dorian Bruch | Light Controlled Delivery of P53 Using Plasmonic Gold Nanoparticles |
| 98 | EUREKA | Van Hsieh | The Effect of WDR5B on Cell Adhesion in Cancer Metastasis |

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|---|---|---|---|
| 86 | EUREKA | Valerie Lensch | Aptamer Directed Synergistic Drug Delivery |
| 39 | EUREKA | Brett McKim | How Winds and Sea Level Differences Control Coastal Ocean Currents |
| 66 | EUREKA | Melissa Morales | Reacting CMAS with Yttrium Disilicate Environmental Barrier Coating |
| 22 | EUREKA | Carina Motta | The Effect of Biodiversity Loss and Climate Change on Tick-borne Disease |
| 104 | EUREKA | Andy Rosales Elias | Implementing Machine Learning Based Image Recognition for Animal Detection |
| 112 | EUREKA | Justin Su | Regulation of Microtubule Stability by a Histone Methyltransferase Subunit |
| 10 | FLAM | Nicholas J. Antonellis | Thermally Reconfigurable Mie Resonances in InSb Metasurfaces |
| 36 | FLAM | Dennis Huang | Measuring Surfactant Surface Coverage of Biomimetic Cargos from Interfacial Tension |
| 129 | FLAM | Grace Hubbell | Investigation of Molybdenum-doped Porous Metal Oxides as Catalysts in Biomass Conversion |
| 58 | FLAM | Thomas Ibbetson | Controlling Diffusion in Hydrogels via External Stimuli |
| 85 | FLAM | Aldo Jordan | Exciton Diffusion Length in P3HT with the Presence of Additive F4TCNQ |
| 11 | FLAM | Ji Hyun Kim | Construction of a Microcalorimeter |
| 92 | FLAM | Jason Lipton | Pouch Cells for Zinc-Bromine Batteries |
| 125 | FLAM | Michael Martinez | Incorporation of Donor-Acceptor Stenhouse Adducts onto Polymer Chains |
| 105 | FLAM | Jorge Mata | Optimization and characterization of magnetron sputtered WOx-TiOx thin films |
| 134 | FLAM | Daniel Najera | Expanding Transition-Metal Ketimide Complexes to the Group 10 Elements |
| 118 | FLAM | Brenda Ontiveros | Functional Organic-Inorganic Hybrid Materials for Optoelectronic Applications |
| 130 | FLAM | Minue Perez | Preparation, Characterization and Electrochemical Testing of Transition Metal Sulfides for Conversion Battery Materials |
| 121 | FLAM | Terrence Polk | Conductivity in 3D Printing Ink Using Acoustically Focused Microparticles |

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|---|---|---|---|
| 65 | FLAM | Breirra Raynor | Development of an Accurate Assay for the Detection of Tumor Necrosis Factor-Alpha |
| 38 | FLAM | Allison Rugar | Characterizing Diamond Optomechanical Resonators |
| 21 | FLAM | Miranda Sroda | The Synthesis of Sterically Hindered Amines for the Creation of Pharmaceutical Drugs |
| 109 | FLAM | Denis Victorov | Computational Modeling of a Unique Region in Ribosomal RNA |
| 113 | FLAM | Hannah Viola | Comparison of two mussel-derived compounds for applications in mussel-inspired underwater adhesives |
| 102 | FLAM | Natalie White | Using microscopy to assess the duration of stability of a hydrophobic drug within lipid membranes |
| 12 | Gorman | Meital Carmi | Shear Flows of Dense Suspensions |
| 133 | Gorman | Ian Jenkins | New Apparatus for Double Nuclear Magnetic Resonance Experiments |
| 64 | Gorman | Fernando Mendoza Rincon | Enhancing Spectral Usage Through Full Duplex Communication |
| 106 | Gorman | David Nakazono | Increasing Organic Photovoltaic (OPV) Efficiency |
| 13 | INSET | Bofeng Chen | Synthesizing Agarose Microparticle Cell Mimics to Characterize μHammer Device |
| 37 | ICB SABRE | Tsion Andine | Effects of Transcranial Magnetic Stimulation on Memory-Based Decision-Making |
| 77 | ICB SABRE | Desiree Conton | Contextual Information Influence on Steady-State Visually Evoked Potentials during Visual Search |
| 14 | ICB SABRE | Temesgen Fiseha | Combining Top-Down and Bottom-Up Approaches in Deep Learning |
| 59 | ICB SABRE | Sebastian Fonseca | Generating Isogenic Cell Lines To Study The Influence of The CRB1 Gene on Retinal Degradation |
| 49 | MARC | Young Hun Kim | Detecting and Quantifying Bacteriophage M13 on Human Skin |
| 78 | MARC | Shelby Shankel | Facile Chain End Modification of RAFT Polymers |
| 15 | Math REU | Erica Clark<br>Thomas Retzloff<br>Ian Texeira<br>Susan Ye | Representation Theory of the 2 × 2 Reflection Equation Algebra $\mathscr{A}(2)$ |
| 60 | Math REU | Eleanor Campbell<br>Phoebe Coy | Combinatorial Model of Quantum Skew Symmetric Matrices |

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|---|---|---|---|
| 79 | Math REU | Madeline Martin<br>Alexander Song<br>Irina Viviano | A Simplified Approach to Block-Symmetric Linearizations of a Matrix Polynomial |
| 93 | Math REU | Rafael Saavedra<br>Bradley Zykoski | A unified approach for Fiedler-like pencils via block minimal bases pencils |
| 107 | Math REU | Christopher Keane<br>Samuel Kater | $\mathscr{K}$- Primes of the Quantum Grassmannian |
| 16 | McNair | Juan Carlos Banda | Newspaper Coverage and Representation of the 2007-2009 Recession |
| 40 | McNair | Fernanda Castellon | Targeting IEP Social Goals in a Community Summer Camp Setting for Children with Autism |
| 50 | McNair | Marco Cerrato | Digital Control Electronics for Optical Gyroscopes |
| 46 | McNair | Daniel Cha | Simple Groups and Short Exact Sequences |
| 20 | McNair | Katie Corriea | On the Precipice of Change: The Fifth Monarchists |
| 61 | McNair | Zingha Foma | Fashion, Power & Identity: Traditional dress as a symbol of resistance in 20th century Nigeria |
| 114 | McNair | Maria Garcia Garcia | Latino Adolescents' Mental Health |
| 80 | McNair | Angel Gonzalez | Volcano Infrasound: An Overview |
| 108 | McNair | Joshua Hudson | Land of Injustice: The Community Struggles over Land Redistribution in South Africa |
| 63 | McNair | Monica Lemus Valencia | Mapping Mexico's Narcotrafficking: Analyzing the Spatial-Temporal Distribution of Cartel Violence and Political Control |
| 17 | McNair | Victoria Melgarejo | Staying Relevant: A Comparison of Popular Media and the Linguistic Portrayal of Latinas/os |
| 94 | McNair | Andrea Mora | Utilization of Campus Student Services among Latino/a College Students: A Mixed-Methods Approach |
| 119 | McNair | Jorga Moran | The Rise of China: A Look into How China Is Solidifying Its Position as an East Asian Major Power |
| 41 | McNair | Francisco Olvera | A World I Never Made: Identity Dualism in The Fictional Novels *George Washington Goméz* and *The Autobiography of a Brown Buffalo* |
| 82 | McNair | Marina Quintanilla | HIV Risks among Men Living in Rio De Janeiro, Brazil: Medical History, Sexual Behavior, and Attitude |
| 122 | McNair | Christian Rodriguez | Designing a Novel Telescope for Exoplanet Research |

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|---|---|---|---|
| 123 | McNair | Sirenia Sanchez | Is readability an open invitation to rejection, or solution?: The effects of self-esteem on self-disclosure when feeling readable |
| 110 | McNair | Nancy Torres | Determining Propane Consumption by Marine Microbial Populations in Seawater |
| 115 | McNair | Syrian Truong | Stochastic Series Expansion Quantum Monte Carlo Simulations for Investigating Eigenstate Thermalization |
| 18 | Network Science | Angel Ortega | News Bias in Online News |
| 111 | Network Science | Taom Sakal | Computational Complexity of Solving Network Dynamics |
| 19 | PIPELINES | Carolina Espinoza<br>Aaron Lovato<br>Isaac Norales | Corrosion Resistant Reinforced Concrete for Marine Environments |
| 42 | PIPELINES | Kevin Hurtado<br>Corey Stein | Ladder for Amphibious Systems |
| 62 | PIPELINES | Ben Kennedy<br>Marshall Laminen<br>Mario Moreno | Optical Fiber Link for Small Buoys |
| 81 | PIPELINES | Avi Loschak<br>Nathan Lubega<br>Argin Petrosian | RE-IT: Renewable Energy Integration Tool |
| 95 | PIPELINES | Peter Moschetti<br>Amy Duggal<br>Kaela Malaki<br>Nick Hardy | Toward NetZero CLUs: A New Method to Minimize Dust-Induced Efficiency Losses in Solar Panels |
| 55 | UCLEADS | Omar Curiel | An affordable, open-source system for high-resolution, high-speed measurements of fluid velocity fields for engineering research and education |
| 27 | UCLEADS | Ximena Garcia Arceo | Effects of Tau Proteins and Counterions on Microtubules |
| 56 | UCLEADS | Ramces Gonzalez | Improving Signal-to-Noise Ratio of DNA-Based Biosensors through the Increase of Electrode Surface Roughness |
| 29 | UCLEADS | Shannon Grossman | Eliminating the Cytotoxicity of DAC |
| 58 | UCLEADS | Emmanuel Kayede | Atomic Layer for Transistor Scaling |
| 28 | UCLEADS | Rachel Liu | Feeding Marine Microbes: Toluene Biodegradation in the Gulf of Mexico |
| 30 | UCLEADS | David Lowe | Anastasis: an in vivo and in vitro approach towards understanding the reversal of apoptosis |

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