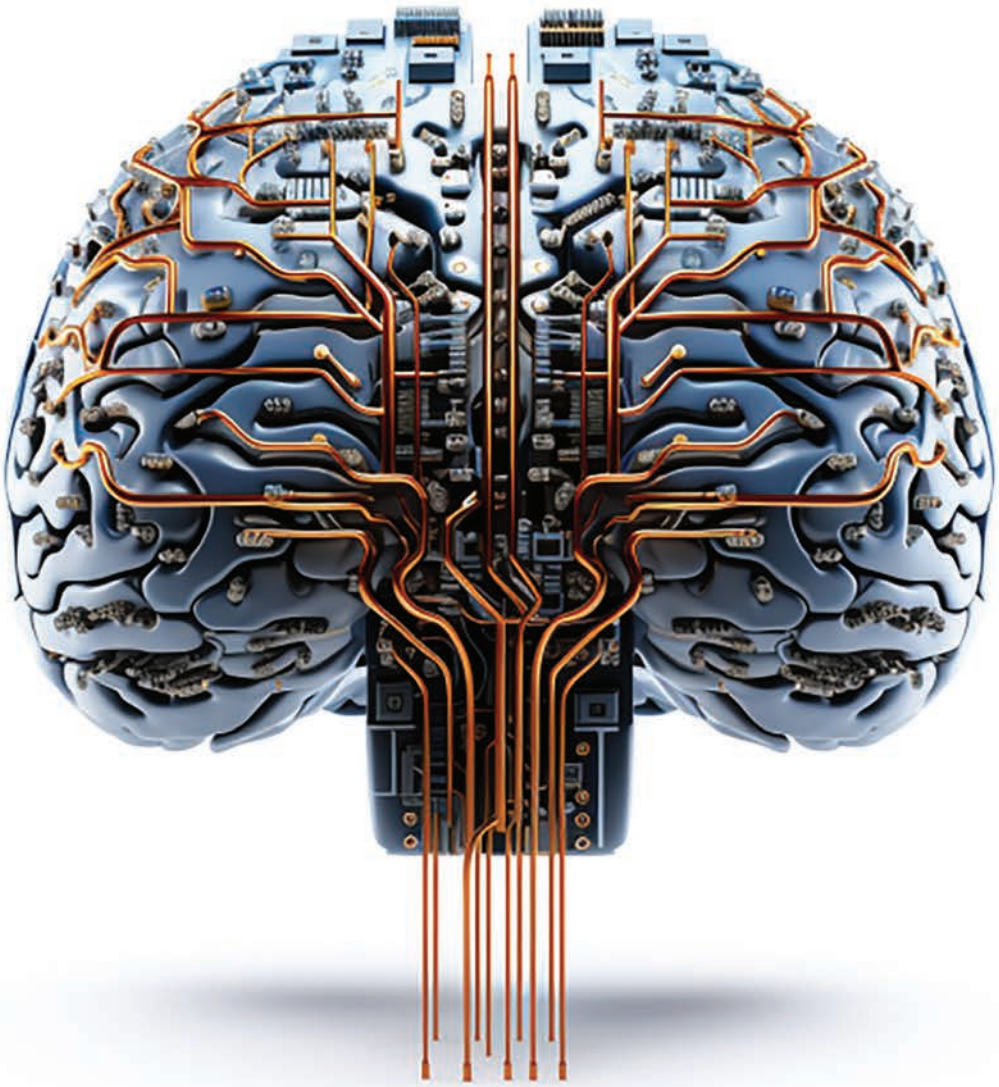
THE ECE CURRENT

2023-2024

UC **SANTA BARBARA**

Electrical and Computer Engineering

College of Engineering



Research Initiatives

Letter from the Chair **2023-2024**

As we embark on the 2023 academic year, we extend a warm welcome to our new cohort of CE and EE majors and graduate students, as well as our esteemed faculty and staff. We take great pleasure in introducing two additions to our faculty: Qian Yu, a new member of the CCSP faculty whose research expertise spans information theory, learning theory, and distributed computing; and Niels Volkmann, who joins UCSB with appointments in ECE, BMSE, BioE, and brings a wealth of knowledge in computational analysis of cryo-EM, including data integration from diverse modalities.

In addition, we welcome the appointment of ECE Professor Umesh Mishra as the new dean of the College of Engineering. Additionally, we congratulate Professors Galan Moody and Zheng Zhang on their well-deserved tenure appointments, recognizing their invaluable contributions to both research and teaching.

In Spring 2023, our department held our first ECE Summit event, showcased in this newsletter, marking a successful debut that we're eager to make an annual tradition, fostering collaboration and growth within the ECE community. In addition, over the last three years the ECE department's extramural research funding has averaged $20 million annually. We continue to lead the way in groundbreaking research while upholding our commitment to excellence in teaching and innovation.

As we look ahead, we are excited and optimistic about the prospects of the coming year. Thank you to everyone for your unwavering support and commitment. Together, let us embark on another successful year, shaping the future of electrical and computer engineering.

B.S. Manjunath, ECE Chair

New **Faculty**

NIELS VOLKMANN

Niels was educated at the University of Hamburg, Germany, and obtained his PhD at the Max Planck Institute in Hamburg with Ada Yonath, who won the Nobel Prize in 2009. Niels completed training as a postdoctoral fellow at Brandeis University with David DeRosier, one of the founding fathers of three-dimensional image reconstruction techniques.

Niels' research focuses on the development and application of innovative new computational, artificial intelligence, and data science tools to bridge information between the atomic and cellular scales, covering more than six orders of magnitude from Ångstroms to tens of microns. Central to this effort is the analysis and interpretation of data from electron cryo-microscopy and cellular electron cryo-tomography. These two rapidly emerging methodologies offer the possibility of not only linking these scales through correlative studies with other techniques such as light microscopy and X-ray crystallography, but also to create three-dimensional mappings of entire cellular proteomes, including direct in-situ study of molecular interactions and structure at the near-atomic scale in cryogenically preserved, unstained and unprocessed cells and tissues.

QIAN YU

Qian received his PhD from the Department of Electrical and Computer Engineering at University of Southern California (USC). He received a Mechanical Engineering degree in Electrical Engineering and a BS degree in Physics and Electrical Engineering and Computer Sciences, both from Massachusetts Institute of Technology (MIT). Before joining UCSB, Qian was a postdoctoral researcher at Princeton University.

His research interests span information theory, machine learning theory, distributed computing, and many other math-related problems. His research goal is to establish the fundamental limits of physical systems, which involves inventing new mathematical tools to prove impossibility results, and algorithmic designs to achieve optimality. He received the Thomas M. Cover Dissertation Award in 2022 for his works on coded computation, and the Jack Keil Wolf ISIT Student Paper Award in 2017 for coded caching.

FACULTY AWARDS & HONORS

1 Kerem Çamsari
2023 NSF Career Award

2 Steven Denbaars
2022 Fellow of Optica (formerly OSA)

3 Yogananda Isukapalli
2023 Outstanding Faculty Award in Computer Engineering (CE)

4 Jonathan Klamkin
2022 Fellow of Optica (formerly OSA)

5 U. Madhow
2022 Fellow of the National Academy of Inventors

6 B.S. Manjunath
2022 Fellow of the National Academy of Inventors;
2023 Elected Member of the American Institute for Medical and Biological Engineers' (AIMBE) College of Fellows

7 Sanjit Mitra
2022 Elected Member of the European Academy of Sciences and Art (EASA);
2022 International fellow of the Engineering Academy of Japan (EAJ)

8 Umesh Mishra
2022 Foreign Fellow of the Indian National Academy of Engineers

9 Chris Palmstrøm
2023 Fellow of the American Association for the Advancement of Science (AAAS)

10 Mark Rodwell
2022 University Research Award from the Semiconductor Industry Association (SIA) and the Semiconductor Research Corporation (SRC);
2023 Outstanding Faculty Member Award in Electrical Engineering (EE)

11 Dmitri Strukov
2023 Fellow of IEEE

Fang Fellowship
Emmanuel Kayede (EE)

Outstanding Graduating Seniors
Anna Koh (CE)
Yuya Nemoto (EE)

Herbert Kroemer Fellowship
Utku Soylu

Ed Hass Outstanding Junior Award
Yufei Song (CE)
Ananth Pilaka (CE)

Roger Wood Scholarship Award
Brandon Lee (CE)
Hunter Larson (EE)

Fiona and Michael Goodchild Mentoring Award
Shailja

Outstanding Senior
Tianrui Hu (CE)
Sean Tseng (EE)

Rediker Scholarship
Harshita Gangaswamy (CE)
Armand Madan (EE)

John and Sheila Lake Excellence Award
Jorge Gutierrez

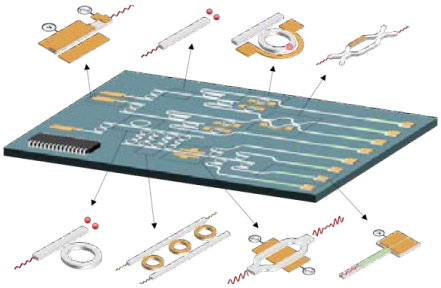
Outstanding Teaching Assistants
Min Jian Yang (CE)
Kunjesh Agashiwala (EE)

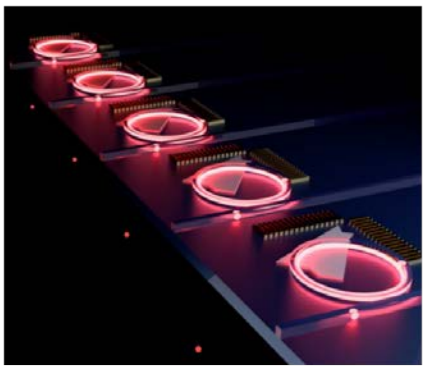
ECE Outstanding Dissertation Award
Hector Andrade

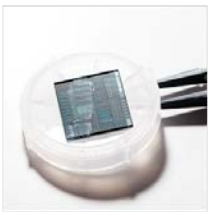
Summer '23 Research Accelerator Award
Shirshendu Chatterjee

Galan Moody

The Quantum Photonics Lab @ UCSB







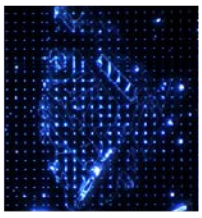
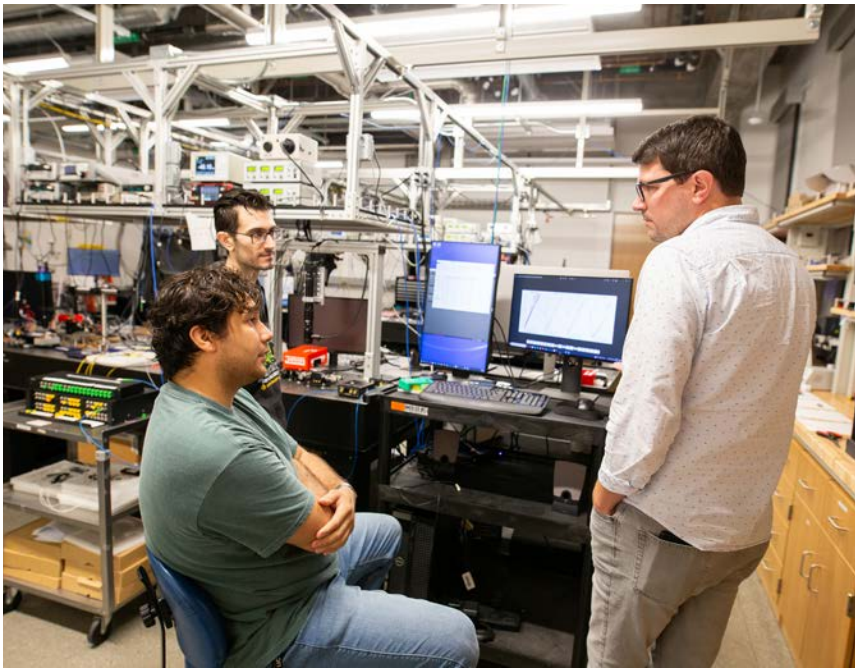


Figure 1 *– QPL develops integrated photonic technologies for quantum information science and related applications. We specialize in III-V materials, such as AlGaAs and InGaP, as well as engineering 2D materials for quantum light generation.*

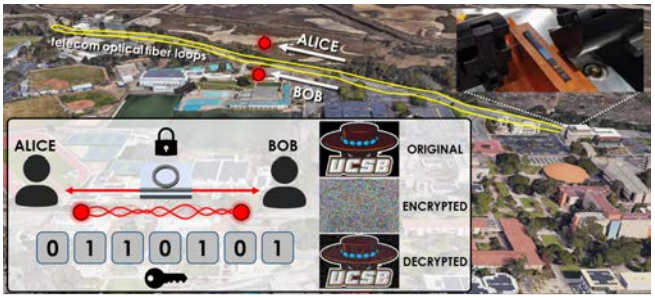
Over nearly a century ago, quantum mechanics changed how we view the world around us. Since then, many transformative technologies have relied on quantum phenomena, from the transistor that powers all our electronics and the laser that drives global connectivity to atomic clocks that enable precision timekeeping and GPS synchronization. We are now experiencing another quantum revolution in which new technologies leverage entanglement between quantum objects—what Einstein called "spooky action at a distance." Recent demonstrations of so-called *Quantum 2.0* technologies include small-scale quantum computers, quantum communications links, and quantum-enhanced sensors. Yet, many open challenges remain: How far can we push the performance of quantum bits (qubits)—the fundamental building block of all *Quantum 2.0* systems? How do we go from a few qubits to thousands or millions of entangled qubits needed for quantum computing? And how can we leverage quantum mechanics to sense the world around us in ways that aren't possible with classical devices?

In the Quantum Photonics Lab (QPL), we address many of these open challenges by developing integrated photonic technologies—the optical analog of microelectronics. We use the photon as our building block—quantum information can be encoded, processed, stored, and transmitted using different properties of light itself, such as its polarization or frequency. Photons are ideal carriers of quantum information: they interact weakly with their environment enabling room temperature devices; they carry information at the speed of light; and we can leverage existing integrated photonic and telecommunications fiber optic infrastructure.
Our group designs, fabricates, and tests a variety of integrated photonic technologies, some of which are shown in Figure 1. Our group has pushed the frontiers of quantum light generation: by replacing silicon, the conventional material for



Galan Moody discusses research questions with QPL members Nick Lewis and Joshua Castro.

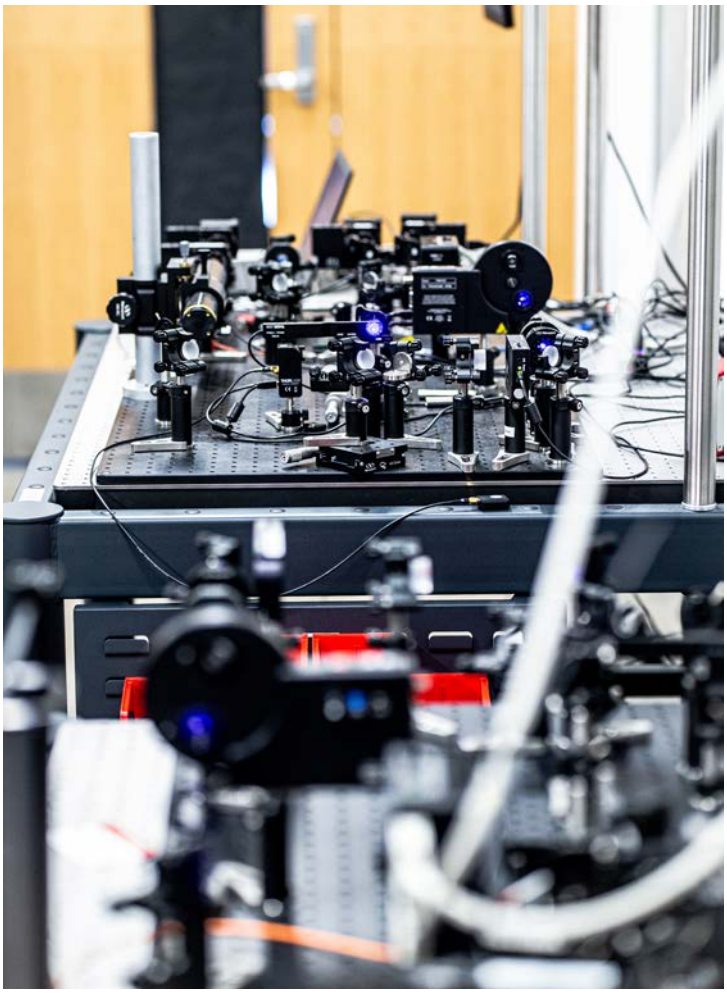
***Figure 2** – entanglement-based quantum communications using telecom-wavelength optical fibers installed on UCSB's campus to create a quantum-secured key for encrypted communications.*



integrated photonics, with the highly nonlinear AlGaAs material, our team demonstrated a nearly 1,000-fold improvement in the brightness of entangled photon sources. These can be combined with up to thousands of optical components onto a single semiconductor chip, such as quantum light sources, modulators, filters, and detectors, to manipulate and detect entanglement across many photonic qubits. Their functionality can be augmented through the heterogeneous integration of other materials that the QPL specialized in. For example, by integrating defect-based quantum emitters engineered in 2D materials with silicon nitride photonic resonators, we demonstrated ultra-efficient, room temperature, on-chip single-photon sources in a CMOS-compatible photonic platform.

Figure 2 illustrates one immediate application of integrated photonic entangled-pair sources: Quantum Key Distribution (QKD). By sending entangled photons generated from AlGaAs resonators in our lab in Henley Hall along a campus fiber-optic optic loop to two receivers (Alice and Bob), we can generate a digital key used for encrypted communications, where the security is guaranteed by the laws of quantum mechanics.

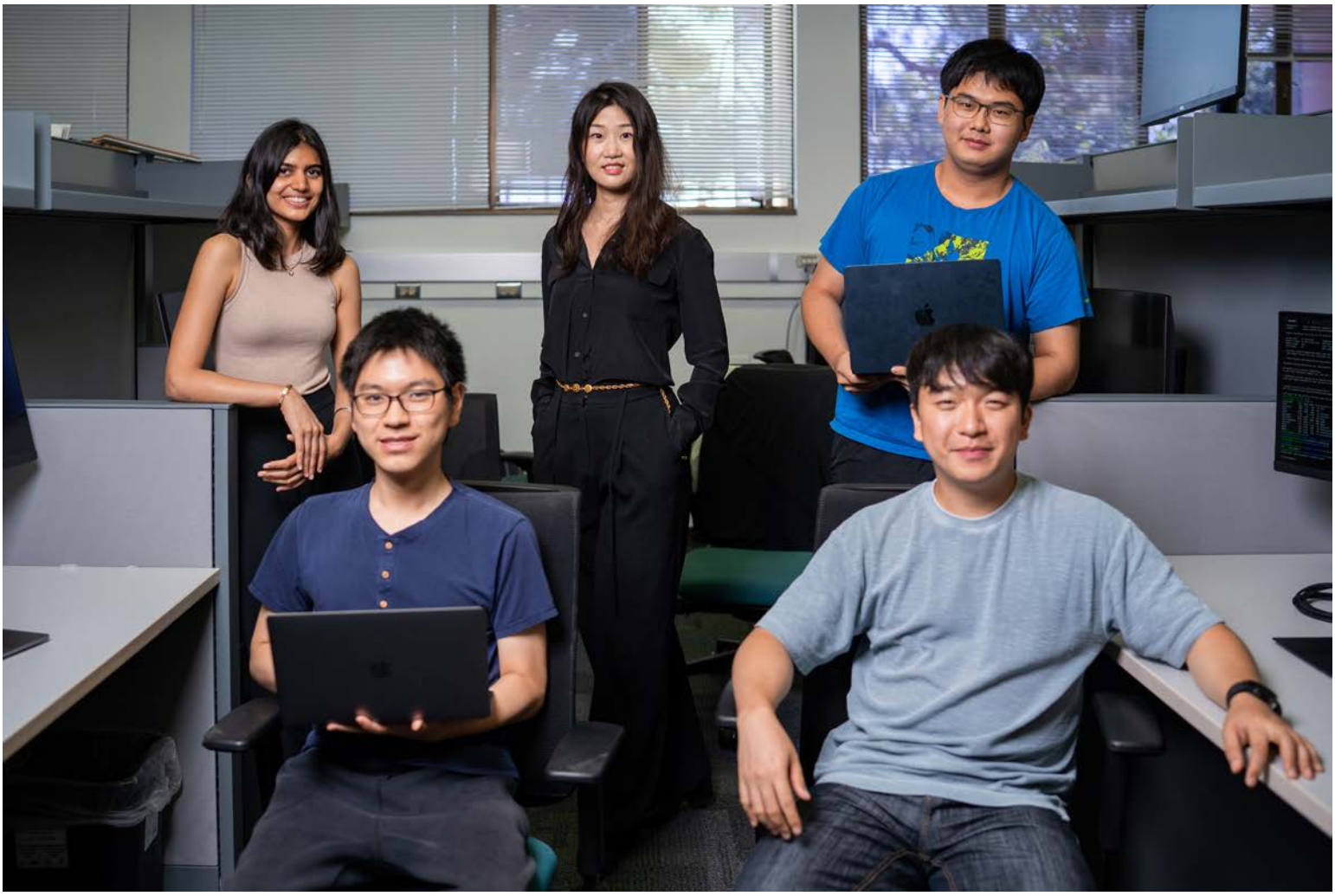
In the QPL, we enjoy the challenges of combining many different material systems with integrated photonics, leveraging each of the materials' advantages. Our research is highly interdisciplinary, and our team comprises undergraduate and graduate students from electrical engineering, materials science, physics, and other fields, which makes for a collaborative and creative research environment. We also value connecting with our community, and in collaboration with UCSB's CSEP, we have developed and contributed to many outreach activities, student mentorship and professional development, and new courses enabling hands-on training with quantum hardware. For more information about QPL group members, their research, and our outreach and education activities, visit https://qpl.ece.ucsb.edu.



This machine in the QPL entangles photons by guiding lasers through a series of lenses. The lenses improve the quality of the photons passing through.

A Pathway to Trustworthy Foundation Models

Yao Qin's group addresses degradation in performance stemming from robustness issues to help treat those with type-1 diabetes



Yao Qin stands with ECE students

Deep Neural Networks have achieved significant success, yet they continue to suffer from various robustness issues, especially when being deployed in the real world. For example, neural networks suffer from sensitivity to distributional shift, when a model is tested on a data distribution different from what it was trained on. Such a shift is frequently encountered in practical deployments and can lead to a substantial degradation in performance. In addition, models are often over-confident in their predictions. A well-calibrated model should have confidence aligned with its accuracy, but standard training methods do not inherently calibrateconfidence in accordance with performance.

Furthermore, neural networks are vulnerable to adversarial examples – small perturbations to the input can successfully fool classifiers into making incorrect predictions. The susceptibility to adversarial attacks poses a great security risk for deploying ML systems, as these types of attacks can bypass human scrutiny. Taken together, there are significant challenges in building trustworthy foundation models for real-world deployment, especially in safety-critical applications. In order to achieve trustworthy foundation models, we aim to enhance robustness through every stage of model development, from safe data collection & augmentation, to efficient & robust training techniques, as well as developing comprehensive evaluations of model robustness. In addition, as robustness takes on paramount significance for safety-critical applications, our lab aims to unlock the power of data-driven machine learning for diabetes care. Type-1 diabetes, in particular, poses unique challenges and demands precise management to ensure the well-being of patients. One crucial aspect of this management is insulin recommendation, a process that requires accuracy and safety to prevent potentially life-threatening complications. To address this challenge, we are embarking on a journey to develop machine learning models dedicated to insulin recommendation.

These models will automate the insulin recommendation process, reducing the burden on both patients and healthcare providers. In addition, we will prioritize safety and robustness in model design to ensure that the recommended insulin doses are aligned with patients' specific needs and medical history. This will lead to more timely and efficient insulin adjustments, potentially improving the overall quality of life for individuals with type-1 diabetes.

EE **Capstone** Projects 2023

Through the UCSB Electrical Engineering (EE) Capstone Projects program, all EE seniors complete a year-long engineering design project, either as part of a 4-5 person team of Electrical Engineering students or on a 10-12 person multidisciplinary team that also includes Mechanical Engineering and Art Students. Projects are completed in collaboration with and are mentored by industry partners and UCSB research labs.

In the 2022-23 academic year, our students completed 9 EE-focused projects and 3 multidisciplinary projects in areas such as robotics, control systems, vision systems and AI, RF circuits, optics, autonomous driving, embedded design, and many others. Several teams also entered their projects in various competitions, including OceanPulse (EE), whose networked buoy system for ocean monitoring propelled them to the finals of the 2023 UCSB New Venture Competition, and GANER (multidisciplinary), whose ship maintenance robot placed first in the US Navy's 2023 Robot Rodeo competition.

All participating students presented their projects at the 2023 UCSB Engineering Design Expo, during which a panel of industry and faculty judges selected the top projects to receive the following awards:

Excellence in Multidisciplinary Engineering:

GANER

Excellence in Electrical Engineering:

LineAlert

Outstanding Innovation in Electrical Engineering:

FusionSense

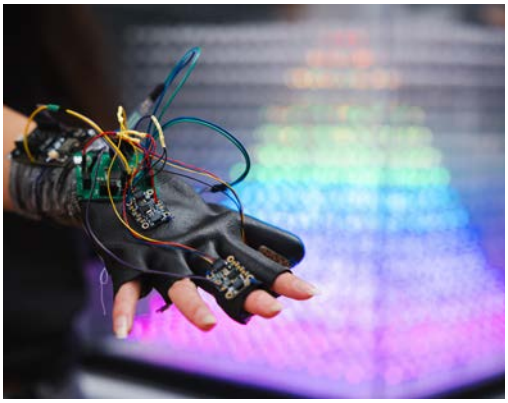
Distinguished Technical Achievement in Electrical Engineering:

ASML ControlSense

More information on all projects can be found at:
https://capstone.engineering.ucsb.edu/projects

CE **Capstone** Projects 2023

Last year, Computer Engineering (CE) students successfully completed their capstone projects that creatively combined technologies across different disciplines to solve real-world problems effectively. Team Data Driven developed an OBD2 plug-compatible device that allows companies to easily manage their system's diagnostic data from a fleet of cars, all on a simple and intuitive web interface. Team Dragonfly unified multiple status sensors into a single compact USB device that consolidates the data from all the sensors into a single packet for easy, effective state estimation of drones and UAVs. Team P.I.G.S. created a personal drone monitoring system that allows users to dispatch drones to collect information and spot potential risks using a high-level phone interface. Team HandLED built a 3D matrix of LEDs with a companion app and gesture recognition glove that allows users to more intuitively visualize 3D graphs and models in an actual 3D environment. Team Small.e fabricated a deep water, long-period video monitoring, and DNA sample collection system that allows scientists to monitor the evolutionary history of Ostracods. Team Defect Detect developed a low-cost, high-accuracy deep neural network-based defective object detection and removal system to replace outdated lower-accuracy systems currently in place in many factories. Lastly, team Viewpointe processed data from two cameras in FPGA hardware to create low-latency real-time 3D images that eye surgeons can use to better visualize patients' eyes during operations.



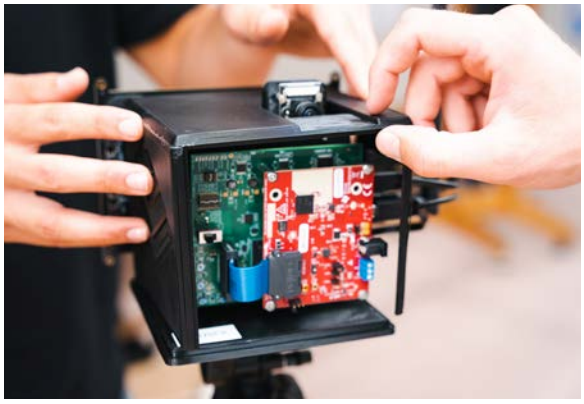
Best project award winners:

1. HandLED
2. Data Driven
3. Small.e

Student names and other project details can be found at:
https://web.ece.ucsb.edu/~yoga/capstone/projects/2023/

Spotlight on FusionSense

An open-source tool that allows for real-time collection of mm-wave radar data, developed by 2023 EE Capstone Seniors



ECE students Nihal Singh, Jackie Chen, Alex Dinkelacker, Philippe Rerolle, and Owen Convery demonstrate FusionSense during the 2023 capstone event

With increasing interest in object tracking technology for applications such as autonomous vehicles and airspace safety, the issues of size and scalability of the sensor units are currently blocking the widespread implementation of new technologies. Millimeter wave (mm-wave) radar is an attractive technology for these applications due to its high resolution, small antenna size, and relatively low cost-per-unit. However, radar systems can only detect positions of objects that are within line-of-sight of the units, and velocities that are parallel to the units' antenna arrays. It can therefore be desirable to create a network of radar nodes, for example at a variety of points at a busy road intersection, that interface with one another to collectively provide all of the information needed to track all objects in the intersection.

Experimentation with mm-wave radar technology has been greatly facilitated by the release of mm-wave radar development boards, along with a software API for interfacing with the boards, by Texas Instruments (TI). However, the existing API only permits collection of raw radar data over some time period to be stored for subsequent analysis. Real-time access to raw data, which is crucial for innovations in technology development and deployment, is not available.

As part of a collaboration between the UCSB EE Capstone projects program and the research groups of Professors Jim Buckwalter and U. Madhow, a group of 5 EE seniors spent the 2022-23 academic year creating FusionSense, an open-source tool that allows for real-time collection of mm-wave radar data. FusionSense includes radar nodes with TI's mm-wave technology that are each coupled to a software package that can both control the radar node and collect real-time data with minimal time lag. This system has opened the door to a host of applications, such as those that require real-time interfacing of multiple radar nodes. FusionSense is currently being used by researchers at UCSB for fundamental research in radar imaging targeting applications such as vehicular autonomy, as well as by a research group at the University of Alabama to develop real-time automated transcription of American Sign Language (ASL).

More information about FusionSense can be found at: https://capstone.engineering.ucsb.edu/projects/buckwalter-madhow-lab-fusionsense

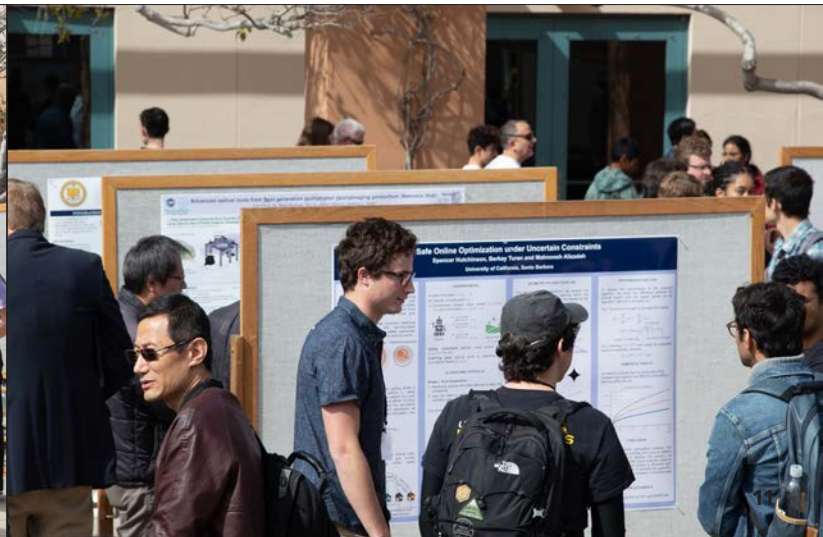
ECE Summit 2023

The ECE Department held its first-ever ECE Summit Day, starting with a warm welcome from EVC David Marshall. He set the stage for an exciting day ahead, expressing his enthusiasm for the impressive achievements of the Department, faculty, current and former students.

The event commenced with a faculty keynote address by Professor Umesh Mishra, the College of Engineering's newly appointed dean. His keynote centered on his pioneering research in gallium nitride, a high-performance wide-bandgap semiconductor material that has and continues to play a pivotal role in meeting the demand for energy-efficient devices. This was followed by a series of faculty talks delivered by Professors Mahnoosh Alizadeh, Spencer Smith, Kerem Çamsari, Nina Miolane, Pradeep Sen, and Haewon Jeong. Their presentations offered a diverse range of topics and perspectives, providing attendees with a comprehensive overview of cutting-edge research and developments within the department.

Yulun Wang, an alumnus of the department, member of the National Academy of Engineering (NAE) and fellow at Teledoc Health, gave an industry keynote and participated in a panel discussion, moderated by Mike Peters from Applied Materials. The industry experts on the panel included ECE alumni Aruna Jammalamadaka from HRL Laboratories, Primit Parikh from Transphorm, Sandeep Gupta from Amazon, Douglas Fouts from Naval Postgraduate School, and Alexander Fang from Entrada Ventures. The panelists engaged in a lively discussion, sharing their expertise, experiences within the UCSB ECE Department, and valuable insights as Alumni.

The event also highlighted the achievements and activities of student groups, including the Graduate Student Association and IEEE. The following poster session and reception facilitated networking and idea exchange. Overall, the event was a success, offering engaging talks, industry perspectives, and opportunities for collaboration and growth.



ECE Summit Panelists

Mike Peters (Moderator) RF Segment Solutions, Applied Materials - ICAPS (MS, UCSB)

Mike Peters received his master's degree in Electrical and Computer Engineering from UCSB in 1987. Since graduating, he has spent over 30 years in the semiconductor industry, holding positions in test and process engineering, program management, foundry product, technology marketing, and supply chain management. Mike is currently serving as the Director for RF Segment Solutions for Applied Materials. His current work is in the development of wafer fabrication equipment technology roadmaps and market analysis for RF and wireless communication related applications. Mike has remained an active alumnus over the years and has coordinated multi-project wafer fabrication design projects, which gives current ECE students the opportunity to submit their circuit designs and receive feedback on their efficacy from wafer fabrication foundries.
In the spring, Mike moderated the first ECE Summit and spoke about his experience, "I enjoyed moderating the panel and hearing the excellent advice and interesting life experiences that were shared by the panelists. It was great to see the engagement and enthusiastic response from the students in the audience."

Aruna Jammalamadaka (Panelist) HRL Laboratories (BS/MS/PhD, UCSB)

Aruna Jammalamadaka received her bachelor's degree in Electrical Engineering (2006), master's degree in Processing and Communication with a minor in Computational Science (2007), and PhD (2014) all from UCSB. She is currently a Scientist V at HRL Laboratories, where she works on applied research problems in the intersection of causal inference and machine learning. She has been a program manager and principal investigator on multiple internally and externally funded programs for government and commercial agencies. She is the author of 30+ publications, patents, and patents pending. Prior to joining HRL she worked for Social Intelligence, a start-up company focused on performing 3rd party background checks from publicly available data for employment, insurance, and security clearance screenings.
When asked to give advice to current ECE students, Aruna said, "The most important skill I learned is how to communicate the impact of my work (the "Big Picture" in the words of my advisor Dr. Manjunath) at an appropriate level of detail for a specific audience. I believe this skill has been crucial in helping me obtain funding, run successful interdisciplinary projects, and pass my excitement for my work on to younger researchers. This is something that takes practice, so discuss your work (including class assignments!) with as many different types of people as you can – you never know what doors it may open for you."

Primit Parikh (Panelist) Co founder, Transphorm (MS/PhD, UCSB)

Primit Parikh received his PhD in Electrical and Computer Engineering from UCSB in 1998. Primit is the Cofounder and President of Transphorm, a leader in GaN Power Semiconductors. Prior to cofounding Transphorm, he led GaN electronics at Nitres Inc. through its acquisition by Cree, where he held multiple positions. With over 25 years of semiconductor and entrepreneurial experience, his background includes capital raises, international markets, strategic partnerships, key customer relationships, product manufacturing, IP, GaN technology, and government contracting. He has been awarded more than 40 patents and coauthored more than 75 publications.

Sandeep Gupta (Panelist) VP Amazon Payments (BS, UCSB)

Sandeep Gupta received his bachelor's degree in Electrical Engineering from UCSB. He currently serves as the Vice President of Amazon Payment Products and Services. He previously served as Vice President and General Manager for Amazon Fire TV, where he developed Fire TV into a leading global content streaming device with over 150M devices sold and expanded the business by building relationships with partners such as Best Buy, TCL, BMW, and Fiat/Chrysler to include distribution on Smart TVs, soundbars, and automotive. Before Amazon, Sandeep held tech and product leadership roles at Yahoo!, Digidesign, and Apple, where he led software development for iPod.
Reflecting on his time at UCSB, Sandeep said, "One of things that was great about going to UCSB versus some of the other engineering institutions is the culture of camaraderie and collaboration. It really sets the right tone for when you enter the real world where your success is very much linked to how well you work with those around you and where team focus and support are key to driving real innovation."

Yulun Wang (Panelist) Teladoc Health (PhD, UCSB)

Yulan Wang received his PhD in Electrical and Computer Engineering from UCSB in 1988. He currently serves as a Fellow at Teladoc Health (NYSE: TDOC), where he contributes to various R&D initiatives and the company's Corporate Social Responsibility efforts. He is the cofounder and chairman of Sovato Health, which works to provide access to remote robotic surgery, and World Telehealth Initiative, a non-profit that works to deliver sustained healthcare to impoverished areas of the world. Wang founded InTouch Health in 2002, which was acquired by Teladoc Health in July 2020. Throughout his career, Wang has been at the forefront of surgical robotics with his development of the voice-controlled robotic arm, AESOP, as well as the ZEUS surgical system. He holds over 200 patents and is author to more than 50 technical publications. He has served on numerous boards of directors, including the advisory board of Electrical and Computer Engineering and Mechanical Engineering departments at UCSB.
Reflecting on his time at UCSB, he said, "What a significant and positive impact UCSB has had on my professional and personal life. Professionally, it gave me the underlying training which I needed to embark on a successful entrepreneurial career in healthcare technology, and personally it's where I found my wife and continued my passion for surfing!"

Douglas Fouts (Panelist) Professor and Chair, Department of Electrical and Computer Engineering, Naval Postgraduate School (PhD, UCSB)

Douglas Fouts received his PhD in Electrical and Computer Engineering at UCSB in 1990. He has served at the Naval Postgraduate School in Monterey, CA. since 1990, where he has held numerous teaching positions and currently serves as the Chair of the Department of Electrical and Computer Engineering. He previously worked as a Design Engineer for Burroughs Corporation, now Unisys, and the Aerospace Corporation. He is a registered Professional Electrical Engineer in the state of California.
When asked about his participation in the first ECE summit, Douglas said, "I discussed careers in academia as a Professor, which can be a very rewarding experience. My presentation also discussed careers for electrical and computer engineers in federal service. The federal government has available jobs for graduates in STEM fields in many different federal agencies."

Alexander Fang (Panelist) Co-founder & Managing Partner, Entrada Ventures (MS/PhD, UCSB)

Alexander Fang received his master's and PhD in Electrical and Computer Engineering from UCSB in 2005 and 2008, respectively. He is the cofounder of Aurrion, where he served as CEO from 2008 to 2016, a UCSB Spinout and fabless semiconductor company that was acquired by Juniper Networks. He is the cofounder and Managing Partner of Entrada Ventures, where he leads investments in early stage tech companies. He currently serves as board director for Quintessent and Coreshell Technologies. Alex has authored over 80 papers, coauthored 3 book chapters, and holds 18 patents.
When asked about being a UCSB alumnus, he said, "UCSB ECE Alumni are a special breed. We're highly collaborative and this leads to higher impact and publication rates than other graduate schools. Take the time to get to know your peers and keep in touch with them after they graduate. Connect deeply and understand each other. Help each other out once you're out in the field. There are so many unique paths and ways we can build our world. We're in this together!"

THANK YOU, **DONORS**

The Department of ECE would like to express its sincere appreciation to the following for their philanthropic support. Your gifts make it possible for the department to continue to advance excellence in our academic program, which continues to be one of the best in the world.

Robert Aparicio ‘77, ‘79

Dr. Abhishek H. Badki ‘15,’21

Dennis ‘86 and Leanna Balzarini, Jr.

Dr. Jeoffrey ‘73, ‘79 and Elaine Benson

Les Bordelon

James ‘85 and Robin Brady

Donald Carson ‘70 and Evelyne Naylor-Carson

Dr. Kwok-Han Chan ‘88, ‘92

Howard and Kathleen Chang

Po-Chun Chang ‘91

Edmond Cheung ‘76

Bill R. Danielson ‘73,’75

Navarasu Dhanasekar and Senthil Kumari Navarasu

Pamela Durand and Michael Kim

Jean Fang and William Vernon

Cynthia ‘85 and Gregg Ferguson

Chester Fleshman ‘80

Melvin Fountain ‘72, ‘75

Dr. Douglas ‘90 and Belle Fouts

Dr. David Gibson ‘65,’84

Thomas ‘79 and Toni ‘79 Guckert

Yi He and Rong Feng

Varun Jain ‘13

H. Eric ‘88 and Shirley Johnson

Robert ‘65 and Andrea Joyce

Suryamani Kar

Laurence Laitinen ‘76

Dr. Kuo-Chin Lien ‘16

Luen-Yuan ‘81 and Anlih Lin

Dr. Stephen and Molly Long

John and Corrie Mills

Antonio Morawski ‘81 and Francoise Schmutz

Alfredo Morelos

Harun Muliadi ‘83

Ron Ocampo ‘13

Stephen ‘86 and Debby Peltan

Dr. Ekta Prashnani ‘15, ‘22

Dr. William Radasky ‘81

David Rink ‘03

Kevin Robertson ‘98,’00

Dr. Michael ‘93, ‘95, ‘00 and Shayne ‘95 Santos

Dr. Edward ‘75,’80 and Judith ‘77 Savage

Jack Schwartz ‘86 and Kyong Yim

Kenneth Shamordola ‘65

Xiaodong Shen ‘99 and Jane Xu

Dr. Allen ‘87, ‘98 and Lisette Shum

Amalia Kessler and Adam Talcott ‘93,’95

David K. Tengan ‘79

Patrick ‘72 and Janis Timlick

Tuan ‘82 and Thuy To

Serdar Turan ‘04

David ‘67,’69 and Karen ‘69 Vandervoet

J. Patrick Waddell ‘69 and Franklin Smyth

Wentong Wang and Dezhong Cai

Yan Wen and Gang Teng

Bryan Wolfgram and Shari Countryman

David Wood and Jane Doughty

Edwin ‘69 and Sylvia Wrench, Jr.

Dr. Steven Wright ‘82

Yong Yu and Wennie Wang

Zhong Yu and Dina Liu

Qing Zhang and Xuemei Yang

Yong Zhang and Qun Yu

Jun Xiu Zhu and Jian Wen Zeng

Corporate and Foundation Support

Adobe Systems Incorporated

AeroVironment, Inc.

Alcon

Amazon.com, Inc.

Analog Devices

Anonymous

Coldquanta

CrossnoKaye

Goleta Star, LLC

Google, Inc.

HRL Laboratories, LLC

Institute for Electrical&Electronic Engineers

Keysight Technologies

Meru Productions, Inc.

Northrop Grumman Space Technology

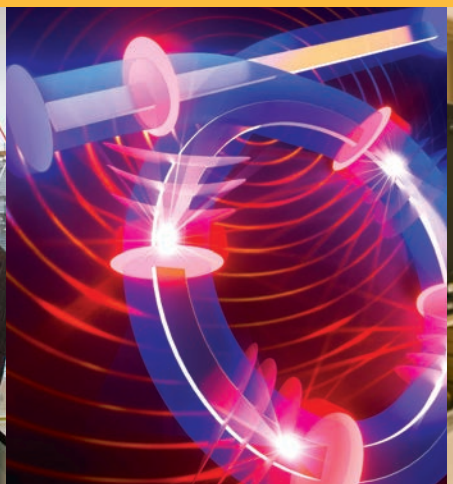
Qualcomm, Inc.

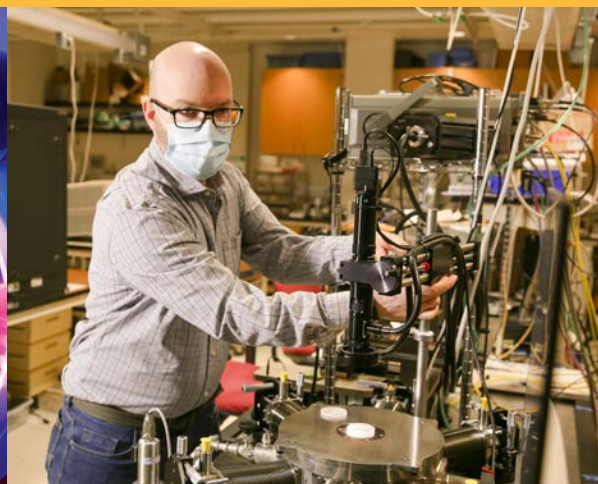
Semiconductor Research Corporation

Teledyne FLIR

The Yan and Ouyang Family Foundation

Thorlabs, Inc.





Invest in the Department of Electrical and Computer Engineering

The goal of the Department of Electrical and Computer Engineering at UC Santa Barbara has always been to provide our students with the best possible opportunities to learn and develop. The faculty, students, and administration have created an atmosphere of interdisciplinary and collaborative research that is renowned throughout the Nation and is the cornerstone of our success. Your investment in the Department of Electrical and Computer Engineering plays a critical role in our ability to fulfill our mission and provides essential support of ECE's teaching program and research enterprise.

Department funding opportunities include:

Unrestricted Support to the ECE Department

Provides students and researchers with resources they need to learn, develop technology, and contribute to the field of electrical and computer engineering

Undergraduate Capstone Project Fund

Supports the projects and activities of students in the electrical engineering and computer engineering Capstone Programs

George Matthaei Undergraduate Award Fund

To honor and support a meritorious undergraduate student studying electrical and/or computer engineering at UCSB

Herbert Kroemer Endowed Fellowship Fund

Provides named fellowship awards to excellent graduate students studying electrical and computer engineering

Roger C. Wood Endowed Fund

Provides named undergraduate scholarships and graduate fellowships, and helps equip and supply state-of-the-art teaching facilities

Petar V. Kokotovic Distinguished Visiting Professorship Fund

Provides a named distinguished visiting professorship with the Center for Control, Dynamical Systems, and Computation (CCDC)

To give to ECE please visit

ece.ucsb.edu/giving

Thank you for your generous gift.

ECE Facts & Figures

46 faculty

557 undergrad students

206 graduate students

$20 M average funding over three years

2 IEEE Medal of Honor

1

#12 public EE graduate program

Nobel laureates

5 NSF PYI/NYI Young Investigators

10 Optica Fellows

2 National Medal of Technology and Innovation

2 Associate for Computing Machinery Fellows

American Association for the Advancement of Science Fellows

42 Institute of Electrical and Electronics Engineers Fellows

American Academy of Arts & Sciences Members

1

11 National Academy of Inventors Fellows

15 National Academy of Engineering members

3 NSF Career Award winners

National Academy of Science Members

5