Presentations in Alphabetical Order by Student

Oral Presentation	***Sebastien N. Abadi*** *Carl F. Braun SURF Fellow*	Simulating and Analyzing the Hyperfine Structure of Erbium-167 Doped Yttrium Orthosilicate With Spectral Hole Burning Spectroscopy	Andrei Faraon *Professor of Applied Physics and Electrical Engineering* Mi Lei *Graduate Student in Applied Physics*
Oral Presentation	***Adam H. Abbas*** *SURF Board SURF Fellow*	Developing Digital Infrastructure for Synthesizing and Probing Quantum Materials	Joseph L. Falson *Assistant Professor of Materials Science*
Oral Presentation	***Sara W. Adams*** *Samuel N. Vodopia and Carol J. Hasson SURF Fellow*	(1) Evaluating Hindsight During the COVID-19 Pandemic; (2) EEG Correlates of Pre-Clinical Alzheimer's Disease	Shinsuke Shimojo *Gertrude Baltimore Professor of Experimental Psychology* Daw-An Wu *Postdoctoral Scholar in Social Neuroscience*
Poster Presentation	***Yasmin V. Afshar*** San Diego State University *GROWTH SURF Fellow*	Follow-Up of Supernovae Using the Liverpool Telescope	Daniel A. Perley *Faculty of Engineering and Technology, Liverpool John Moores University*
Oral Presentation	***Shubh Agrawal*** *Dr. Gary Stupian SURF Fellow*	Negative Electrothermal Feedback in Thermal Kinetic Inductance Detectors Over High Readout Power Regimes	James J. Bock *Professor of Physics; Senior Research Scientist, JPL* Bryan Steinbach *Scientific Research Associate in Observational Cosmology*
Oral Presentation	***Alessio Amaolo*** *Reed and Ruth Brantley SURF Fellow*	Projectors for Evaluation of Observables With Two Dimensional Tensor Networks	Garnet K. Chan *Bren Professor of Chemistry* Matthew O'Rourke *Graduate Student in Chemistry*
Poster Presentation	***Eric P. Amaro***	Designing and Manufacturing an Autoinjector Testing Fixture Which Mimics the Human Arm	Joseph E. Shepherd *C.L. "Kelly" Johnson Professor of Aeronautics and Mechanical Engineering* Donner Schoeffler *Graduate Student in Aerospace*
Oral Presentation	***Galit Anikeeva*** Stanford University *Google Quantum WAVE Fellow*	Covariant Approximate Quantum Error Correcting Codes for Qubits	John P. Preskill *Richard P. Feynman Professor of Theoretical Physics* Sepehr Nezami *Sherman Fairchild Postdoctoral Scholar in Theoretical Physics*

Oral Presentation	***Joeyta Banerjee*** *Arthur R. Adams SURF Fellow*	Comparative Analysis of Workflows for Processing Single Cell mRNA Sequencing Data	Lior S. Pachter *Bren Professor of Computational Biology and Computing and Mathematical Sciences* Rebekah K. Loving Ngo *Graduate Student in Biology*
Oral Presentation	***Anthony C. Bao*** *Saul and Joan Cogen Memorial SURF Fellow*	Quantum Imaginary Time Evolution for the Fermi-Hubbard Model	Austin J. Minnich *Professor of Mechanical Engineering and Applied Physics* Adrian Tan *Graduate Student in Applied Physics*
Oral Presentation	***Hrishika Basava*** *The Aerospace Corporation SURF Fellow*	Inverse Design for Nano-Photonic Antennas	Ali A. Hajimiri *Bren Professor of Electrical Engineering and Medical Engineering*
Oral Presentation	***Rahil Bathwal***	Predicting the Spread of COVID-19 Using Artificial Intelligence	Yaser S. Abu-Mostafa *Professor of Electrical Engineering and Computer Science*
Oral Presentation	***Matthew S. Bauer*** *Eric T. Fung and Julie A. Buckley SURF Fellow*	Feed-Forward Inhibition Can Strengthen Modeled Neural Responses to Narrow Odors in *Drosophila*	Elizabeth J. Hong *Clare Booth Luce Assistant Professor of Neuroscience* Jie-Yoon Yang *Graduate Student in Computation and Neural Systems*
Oral Presentation	***Zoe G. Beatty*** *Rossum Family SURF Fellow*	Computational Design of Binding Pockets for Biosensor Proteins	Henry A. Lester *Professor of Biology* Anand Muthusamy *Graduate Student in Chemistry*
Oral Presentation	***Trinity Bento*** *Saul and Joan Cogen Memorial SURF Fellow*	Stellar Abundances of RR Lyrae Variables in the Outer Halo of the Milky Way Galaxy	Judith G. Cohen *Kate Van Nuys Page Professor of Astronomy*
Oral Presentation	***Daniel W. Bi*** *Karen and James Cutts SURF Fellow*	Understanding the Surface Reflectance of Pluto Using the 2S-ESS Model	Yuk L. Yung *Professor of Planetary Science; Senior Research Scientist, JPL*
Oral Presentation	***Chase Blagden***	Automotive Autonomy: Sensing and Motion Planning	Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL* Anthony Fragoso *Staff Scientist in Aerospace*
Oral Presentation	***Fernando Bolio*** Pomona College	Literature Curation of *Caenorhabditis elegans* Anatomy Functions	Paul W. Sternberg *Bren Professor of Biology* Raymond Lee *Research Scientist in Biology*

Oral Presentation	***James C. Bowden*** *The Associates SURF Fellow*	Deep Kernel Learning for Bayesian Optimization	Yisong Yue *Professor of Computing and Mathematical Sciences* Jialin Song *Graduate Student in Computing and Mathematical Sciences*
Oral Presentation	***Cole J. Brabec*** *Kirk and Marjory Dawson Family SURF Fellow*	Absolute Single Shot Picosecond-Precision Timing Photonic Integrated Circuit Enabling Ultrafast Clock Synchronization and TS/s Digitization	Ali A. Hajimiri *Bren Professor of Electrical Engineering and Medical Engineering*
Poster Presentation	***Hernan R. Caceres***	Leveraging Deep Learning to Strengthen the Security of Mobile Biometrics	Kiran S. Balagani *Associate Professor of Computer Science, New York Institute of Technology* Adam C. Wierman *Professor of Computing and Mathematical Sciences*
Oral Presentation	***JC Daniel Calso*** Glendale Community College *Genentech WAVE Fellow*	Developing a Sprayable Antiviral Coating in Response to the SARS-CoV-2 Pandemic	Robert H. Grubbs *Victor and Elizabeth Atkins Professor of Chemistry; Nobel Laureate* Chris Marotta *Graduate Student in Chemistry*
Oral Presentation	***Luis F. Camargo-Carlos***	10 and 11 Dimensional Linearized Supergravity and the Holoraumy Tensor	Sylvester Gates *Ford Foundation Professor of Physics, Brown University*
Oral Presentation	***Isabella A. Camplisson*** *Hugh F. and Audy Lou Colvin International SURF Fellow*	Using Neural Networks to Investigate Advantages of the Discrete Consciousness Model	Michael Herzog *Professor of Psychophysics, École Polytechnique Fédérale de Lausanne* Ralph Adolphs *Bren Professor of Psychology, Neuroscience, and Biology*
Oral Presentation	***Ann H. Caplin***	Detection of BFB in Cancer Cells Using Human Genomic Data	Vineet Bafna *Professor of Computer Science and Engineering, University of California, San Diego* Jens Luebeck *Graduate Student in Bioinformatics and Systems Biology, University of California, San Diego* David Van Valen *Assistant Professor of Biology and Biological Engineering*

Oral Presentation	***Dominic H. Catanzaro*** *Dr. David G. Goodwin* *SURF Fellow*	Utilizing SPINS Inverse Design to Create On-Chip Accelerator Structures for MeV Dielectric Laser Accelerators	Jelena Vuckovic *Jensen Huang Professor in Global Leadership, Professor of Electrical Engineering, Stanford University* Axel Scherer *Bernard A. Neches Professor of Electrical Engineering, Applied Physics, and Physics*
Oral Presentation	***Isha Chakraborty***	A Novel Application of Polygenic Risk Scores to Transcription Phenotypes	Lior S. Pachter *Bren Professor of Computational Biology and Computing and Mathematical Sciences* Ingileif Hallgrimsdottir *Visiting Associate in Statistical Genetics*
Oral Presentation	***Sophie Chan***	Stratification for Sets of Half-Average Nulls Generate Risk-Limiting Audits	Philip Stark *Professor of Statistics, University of California, Berkeley* R. Michael Alvarez *Professor of Political and Computational Social Science*
Oral Presentation	***Anjini Chandra*** *Mary P. and Dean C. Daily* *SURF Fellow*	Modelling Particle Movement Through Meshes With Implications for Cloth Masks	Lydia Bourouiba *Associate Professor of Civil and Environmental Engineering and Mechanical Engineering, Massachusetts Institute of Technology* Mikhail G. Shapiro *Professor of Chemical Engineering; Investigator, Heritage Medical Research Institute*
Oral Presentation	***Nicholas A. Chang***	Using Machine Learning to Predict the Spread of COVID-19	Yaser S. Abu-Mostafa *Professor of Electrical Engineering and Computer Science*
Oral Presentation	***Diego I. Chavez***	Uncertainty Quantification Using a Game Theoretic Approach	Houman Owhadi *Professor of Applied and Computational Mathematics and Control and Dynamical Systems* Peyman Tavallali *Member of the Technical Staff, JPL*

Oral Presentation	***Cynthia Chen***	Deep Learning for Image Artifact Correction in Non-Cartesian Imaging	Shreyas S. Vasanawala *Professor of Radiology; Director of MRI, Stanford Children's Hospital* Adam Bush *Postdoctoral Research Fellow in Radiology, Stanford University* Adam Blank *Teaching Assistant Professor of Computing and Mathematical Sciences*
Oral Presentation	***Hannah X. Chen***	Integrating Single Cell Transcriptional and Proteomic Data With Deep Learning: An Application to Cancer Immunotherapy	Vanessa D. Jonsson *Assistant Research Professor, City of Hope*
Oral Presentation	***Haoxuan Chen***	Continuous Time Opinion Formation on a Graph	Andrew M. Stuart *Bren Professor of Computing and Mathematical Sciences* Bamdad Hosseini *von Karman Instructor of Computing and Mathematical Sciences*
Oral Presentation	***Kathleen A. Chiu*** *Chung Ip Wing-Wah Memorial SURF Fellow*	On-Chip Training for AI Diagnosis of Cardiac Arrhythmias on an Analog Interface	Azita Emami *Andrew and Peggy Cherng Professor of Electrical Engineering and Medical Engineering; Investigator, Heritage Medical Research Institute* Lin Ma *Graduate Student in Electrical Engineering*
Oral Presentation	***Jennie J. Chung***	Solving Moving Boundary Problems by Incorporating Explicit and Implicit Approximation Schemes	Oscar P. Bruno *Professor of Applied and Computational Mathematics* Daniel V. Leibovici *Graduate Student in Applied and Computational Mathematics*
Oral Presentation	***Norman H. Chung*** *Kiyo and Eiko Tomiyasu SURF Scholar*	Investigating the Application of Particle Image Velocimetry to Multiphase Flows	Melany L. Hunt *Dotty and Dick Hayman Professor of Mechanical Engineering* Yichuan Song *Graduate Student in Aerospace*

Oral Presentation	***Tyler K. Colenbrander*** *James J. Morgan SURF Fellow*	Achieving Near-Unity Absorbance in TMDC Monolayers at Room Temperature to Enable Monolayer Excitonic Solar Cells	Harry A. Atwater *Howard Hughes Professor of Applied Physics and Materials Science* Joeson Wong *Graduate Student in Applied Physics*
Poster Presentation	***Daniel C. Collinson***	Searching for Pulsations in Ultraluminous X-Ray Source X-1 in Galaxy IC 342	Fiona A. Harrison *Harold A. Rosen Professor of Physics* Sean N. Pike *Graduate Student in Physics*
Oral Presentation	***Leah R. Creter*** Pasadena City College *VURP Fellow*	A Search for Outbursting AM CVn Systems in Zwicky Transient Facility Data	James W. Fuller *Assistant Professor of Theoretical Astrophysics* Przemyslaw Mroz *Postdoctoral Scholar in Astronomy*
Oral Presentation	***Molly A. Crotteau*** *Dr. George R. Rossman SURF Fellow*	Applications of Detailed Spectroscopic Studies to the Quantification of H_2O in Rock	George R. Rossman *Professor of Mineralogy* Rebecca Greenberger *Lab Manager and Research Scientist in Planetary Science*
Oral Presentation	***Miles V. Cua***	Unlikely Newton Polygons Arising From Abelian Covers of the Projective Line	Elena Mantovan *Professor of Mathematics*
Oral Presentation	***Isaiah J. Curtis*** *Flintridge Foundation SURF Fellow*	Searching for Cross-Calibration Differences Between NuSTAR and Swift	Fiona A. Harrison *Harold A. Rosen Professor of Physics*
Poster Presentation	***Robert D. Daigle***	Simulations of Low-Swirl Burner for H_2 Combustion	Guillaume Blanquart *Professor of Mechanical Engineering* Joseph Ruan *Graduate Student in Mechanical Engineering*
Oral Presentation	***Lucca S. De Mello***	Are All Fast Radio Bursts the Same?	Charles L. Steinhardt *Associate Professor, Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen* David J. Stevenson *Marvin L. Goldberger Professor of Planetary Science* Melany L. Hunt *Dotty and Dick Hayman Professor of Mechanical Engineering*

Oral Presentation	***Lily K. DeBell*** *Kiyo and Eiko Tomiyasu SURF Scholar*	Towards a Physical Understanding of Water Molecular Dynamics Through Simulation	Geoffrey A. Blake *Professor of Cosmochemistry and Planetary Sciences and Professor of Chemistry* Haw-Wei Lin *Graduate Student in Chemistry*
Poster Presentation	***Serena G. Debesai*** Stanford University *Genentech WAVE Fellow*	Towards a Deep Convolutional Neural Network to Predict Complex Contact Maps for Protein-Protein Docking	Stephen L. Mayo *Bren Professor of Biology and Chemistry*
Oral Presentation	***William M. Dembski***	Towards Learning Representations for Automatic Protein Classification and Design Using Neural Networks	Matthew W. Thomson *Assistant Professor of Computational Biology; Investigator, Heritage Medical Research Institute*
Oral Presentation	***Shrikeshav P. Deshmukh***	PAC-Bayes Generalization Guarantees for a Robot Learning to Pour	Anirudha Majumdar *Assistant Professor of Mechanical and Aerospace Engineering, Princeton University* Zhiyi Ren *Graduate Student in Mechanical and Aerospace Engineering, Princeton University* Richard M. Murray *Thomas E. and Doris Everhart Professor of Control and Dynamical Systems and Bioengineering*
Oral Presentation	***Vidhya M. Dev*** *Sidney and Nancy Petersen SURF Fellow*	Metal-Organic Materials as Barocaloric Materials for Pressure-Induced Solid-State Cooling	Jarad Mason *Assistant Professor of Chemistry and Chemical Biology, Harvard University* Jinyoung Seo *Graduate Student in Chemistry, Harvard University* Theodor Agapie *Professor of Chemistry*
Oral Presentation	***Kiruthika N. Devasenapathy***	Using Machine Learning to Predict the Spread of COVID-19	Yaser S. Abu-Mostafa *Professor of Electrical Engineering and Computer Science*
Oral Presentation	***Audrey J. DeVault*** *Samuel N. Vodopia and Carol J. Hasson SURF Fellow*	X-ray Pulsation Searches With Improved NuSTAR Clock Corrections	Fiona A. Harrison *Harold A. Rosen Professor of Physics* Brian W. Grefenstette *Research Scientist in Physics*

Oral Presentation	***Sophie H. Devoe***	Understanding the Effects of Lithium Plating on Lithium-Ion Batteries Due to Extreme Fast Charging	Michael Toney *Distinguished Staff Scientist, SLAC National Accelerator Laboratory* Melany L. Hunt *Dotty and Dick Hayman Professor of Mechanical Engineering*
Poster Presentation	***Schuyler L. Dick*** *John Stauffer SURF Fellow*	Development of a Low-Cost Optical Particle Counter for Aerosols	Richard C. Flagan *Irma and Ross McCollum-William H. Corcoran Professor of Chemical Engineering and Environmental Science and Engineering* Buddhi Pushpawela *Postdoctoral Scholar in Chemical Engineering*
Poster Presentation	***Evan M. Dicker*** *Fred and Jean Felberg SURF Fellow*	Developing Durable Biocomposites Through Synthesis of *Chlamydomonas* Algae and Agricultural Waste	Chiara Daraio *Professor of Mechanical Engineering and Applied Physics*
Oral Presentation	***Rachel Q. Ding*** *Ron Sven Rat and Bfield SURF Fellow*	Growing Functional Neural Networks on Neuromorphic Chips	Matthew W. Thomson *Assistant Professor of Computational Biology; Investigator, Heritage Medical Research Institute*
Oral Presentation	***Gabrielle M. Dituri***	Study of Low Mass LLP Decaying in the Muon System	Maria Spiropulu *Shang-Yi Ch'en Professor of Physics*
Oral Presentation	***Marcus Dominguez-Kuhne*** *Samuel P. and Frances Krown SURF Fellow*	LAX-Ray (LAteral X-Ray)	Kenneth Y. Goldberg *Professor of Industrial Engineering and Operations Research, University of California, Berkeley* Joel A. Tropp *Steele Family Professor of Applied and Computational Mathematics*
Poster Presentation	***Ismail M. Elmengad***	Disjointedness in the 1-4-6-4-1 Adinkra	Sylvester Gates *Ford Foundation Professor of Physics, Brown University* David Hsieh *Professor of Physics*
Oral Presentation	***Olivia M. Ernst*** *Kevin and Susan Crook SURF Fellow*	Simulations of Particle Flow During Shear	Melany L. Hunt *Dotty and Dick Hayman Professor of Mechanical Engineering* Han-Hsin Lin *Graduate Student in Physics*

Oral Presentation	***Sara M. Fish*** *The Associates SURF Fellow*	A Generalization of a Generalized Turan Problem	David G. Conlon *Professor of Mathematics*
Oral Presentation	***Sasha E. Fishman*** Pasadena City College & The University of Texas at Austin *Thomas Lauritsen SURF Fellow*	Sculpting Sustainable Bioresin: Castable and Optically Clear Biocomposite From Chitosan and Hagfish Slime Fibers	Julia A. Kornfield *Elizabeth W. Gilloon Professor of Chemical Engineering* Priya K. Chittur *Graduate Student in Chemistry*
Oral Presentation	***Alex M. Fontani Herreros*** *John Stauffer SURF Fellow*	Using Density Functional Theory to Afford Multivariable Analysis of the Influence of Molecular Additives on Cu Catalyzed CO_2 Reduction	Jonas C. Peters *Bren Professor of Chemistry* Alonso Rosas *Postdoctoral Research Associate in Chemistry*
Oral Presentation	***Tea D. Freedman-Susskind*** *Donald Voet and Jerome Vinograd SURF Fellow*	Applying Computational Chemistry and Machine Learning Techniques to Optimize Antibody Neutralization for SARS-CoV-2	Vanessa D. Jonsson *Assistant Research Professor, City of Hope*
Oral Presentation	***Bruno A. Freeman***	Generation of Discrete Pedestrian Occupancy Probability Distributions	Richard M. Murray *Thomas E. and Doris Everhart Professor of Control and Dynamical Systems and Bioengineering* Francesca Baldini *Graduate Student in Aeronautics*
Oral Presentation	***Diana C. Frias Franco*** *Carl F. Braun SURF Fellow*	Investigating Multiphase Flow in a Space-Based Catalytic Reactor	Melany L. Hunt *Dotty and Dick Hayman Professor of Mechanical Engineering* Yichuan Song *Graduate Student in Aerospace*
Oral Presentation	***Anderson M. Furlanetto*** Johns Hopkins University	Design of a Cryogenic Test System for Low Light Testing of Large Format Infrared Detectors	Roger M. Smith *Principal Electronics Engineer in Astronomy* Timothee Greffe *Electrical Engineer at Palomar Observatory*
Oral Presentation	***Madeline E. Gardner*** *Taylor W. Lawrence SURF Fellow*	Thermal Simulations for the Sensors for the Barrel Timing Layer of the MIP Timing Detector	Maria Spiropulu *Shang-Yi Ch'en Professor of Physics*
Oral Presentation	***Mohit Garg*** University of Wisconsin, Milwaukee *GROWTH SURF Fellow*	Properties of Pulsars in the Rapid ASKAP Continuum Survey	David Kaplan *Professor of Physics, University of Wisconsin, Milwaukee*

Oral Presentation	***Lauren E. Garriques***	Simulation of Deformation and Stress Distributions in Lattice Structures	Guruswami Ravichandran *John E. Goode, Jr., Professor of Aerospace and Mechanical Engineering* John (Jack) Weeks *Graduate Student in Mechanical Engineering*
Oral Presentation	***Mahideremariyam N. Gessesse***	The Effects of Brain Pulsation During the Cardiac Cycle on Detecting and Sorting Neural Spike Trains	Ueli Rutishauser *Professor of Neuroscience, Cedars-Sinai Medical Center* Clayton P. Mosher *Postdoctoral Scientist in Neurosurgery, Cedars-Sinai Medical Center*
Oral Presentation	***Mahi Gokuli***	Disconnection-Mediated Grain Boundary Motion Resulting From Thermal Fluctuations	Brandon Runnels *Assistant Professor of Mechanical and Aerospace Engineering, University of Colorado, Colorado Springs* Marco Bernardi *Assistant Professor of Applied Physics and Materials Science*
Oral Presentation	***Shir Goldfinger***	Parameterized Simulation of Archeological Ceremonial Sites	Norman I. Badler *Rachleff Family Professor of Computer and Information Science, University of Pennsylvania* Adam Blank *Teaching Assistant Professor of Computing and Mathematical Sciences*
Poster Presentation	***Aanica S. Gonzales-Rogers***	Using the Legacy Survey to Test the Limits of Gaia	Andrew W. Howard *Professor of Astronomy* Ryan Rubenzahl *Graduate Student in Astrophysics*
Oral Presentation	***Aikaterini Gorou*** *John Stauffer SURF Fellow*	Assessing the Deuterium Kinetic Isotope Effect of Hydrogen Radical Reactions on Photochemistry in the Mars Atmosphere	Mitchio Okumura *Professor of Chemical Physics*
Oral Presentation	***Jethin S. Gowda*** *Arthur Rock SURF Fellow*	Predicting the Spread of COVID-19 Using Artificial Intelligence	Yaser S. Abu-Mostafa *Professor of Electrical Engineering and Computer Science*

Oral Presentation	***Akshay R. Gowrishankar***	Building Archival Query and Data Visualization Tools for Data-Driven Sample Exploration	Vivian U *Assistant Researcher in Astronomy, University of California, Irvine* George Privon *Assistant Scientist, National Radio Astronomy Observatory* Andrew W. Howard *Professor of Astronomy*
Oral Presentation	***Hannah E. Grauer***	GPS-Vision Fusion for Relative Spacecraft Navigation	Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL* Vincenzo Capuano *Postdoctoral Scholar in Aerospace*
Oral Presentation	***Wenyan Guan*** *Jean J. Dixon SURF Fellow*	Barkhausen Noise in a Model Quantum Ferromagnet	Thomas F. Rosenbaum *President; Professor of Physics* Daniel Silevitch *Research Professor of Physics*
Oral Presentation	***Rishi Gundakaram***	Ternary Diagrams for Supernova Neutrino Emission Visualization	Kate Scholberg *Professor of Physics, Duke University* Nick R. Hutzler *Assistant Professor of Physics*
Oral Presentation	***Bilge Gungoren*** *John Stauffer SURF Fellow*	Genomic Analysis of Cyanobacterial Gas Vesicle Assembly	Mikhail G. Shapiro *Professor of Chemical Engineering; Investigator, Heritage Medical Research Institute* Bill Ling *Graduate Student in Chemical Engineering*
Oral Presentation	***Arushi Gupta***	p-adic Analogues of Exponential Sums	Xinwen Zhu *Professor of Mathematics*
Oral Presentation	***Matthew R. Hajjar***	Investigation of Challenges in Deep Learning Framework for Diagnostic Image Quality Assessment	Shreyas S. Vasanawala *Professor of Radiology; Director of MRI, Stanford Children's Hospital* Ukash Nakarmi *Postdoctoral Fellow in Radiology and Electrical Engineering, Stanford University* Julian M. Tyszka *Associate Director, Caltech Brain Imaging Center*
Oral Presentation	***Thomas K. Hayama*** *The Aerospace Corporation SURF Fellow*	Blind Domain Adaptation for Automotive Thermal Image Classification	Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL* Anthony Fragoso *Staff Scientist in Aerospace*

Oral Presentation	***Hagan E. Hensley*** *David L. Glackin Memorial SURF Fellow*	Is Star Formation in Early Galaxies the Same as in the Milky Way?	Charles L. Steinhardt *Associate Professor, Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen* David J. Stevenson *Marvin L. Goldberger Professor of Planetary Science*
Oral Presentation	***Valerie S. Hetherington*** *The Aerospace Corporation SURF Fellow*	Classical Simulation of Quantum Time Evolution Using the qDrift Algorithm	John P. Preskill *Richard P. Feynman Professor of Theoretical Physics* Ashley Milsted *IQIM Postdoctoral Scholar in Theoretical Physics*
Oral Presentation	***Sujai Hiremath***	Opinion Formation on Networks	Franca Hoffmann *von Karman Postdoctoral Instructor in Mathematics*
Oral Presentation	***Katelyn A. Horstman*** University of California, Los Angeles	Extracting Radial Velocities of Cool, Low Mass Stars Using Forward Modeling	Dimitri P. Mawet *Professor of Astronomy; Research Scientist, JPL*
Oral Presentation	***Beryl A. Hovis-Afflerbach*** *Alain Porter Memorial SURF Fellow*	High-Mass Stars Stripped in Binaries Missing at Low Metallicity: Tests of Stellar Astrophysics and Gravitational Wave Progenitors	Ylva L. Goetberg *Nashman Postdoctoral Fellow, Carnegie Observatories*
Oral Presentation	***Jennifer A. Hritz*** *John Stauffer SURF Fellow*	Quantum Simulations for XUV Absorbance Spectroscopy	Scott K. Cushing *Assistant Professor of Chemistry*
Oral Presentation	***Wesley Huang*** *Thomas Hunt Morgan SURF Fellow*	Investigating the Role of Malat1 in Co-Transcriptional Splicing	Mitchell Guttman *Professor of Biology; Investigator, Heritage Medical Research Institute* Prashant Bhat *Graduate Student in Biology*
Poster Presentation	***Alexandra I. Hummel***	Creating a Set of Virtual Decision-Making Tasks	Dean Mobbs *Assistant Professor of Cognitive Neuroscience*
Poster Presentation	***Isabella U. Hurvitz*** *Arthur A. Noyes SURF Fellow*	Computational Modeling of Gut Butyrate Dynamics: Towards Enabling Multi-Modal Butyrate Detection Using Noninvasive Yeast-Based Sensors	Arnab Mukherjee *Assistant Professor of Chemical Engineering, University of California, Santa Barbara* Mikhail G. Shapiro *Professor of Chemical Engineering; Investigator, Heritage Medical Research Institute*

Oral Presentation	***Justin J. Hyon*** *Dr. Paraskeva N. Danailov SURF Fellow*	"Team Flow" Real-Time Monitoring and Modulation System	Shinsuke Shimojo *Gertrude Baltimore Professor of Experimental Psychology* Mohammad Shehata *Visiting Associate in Biology and Biological Engineering*
Poster Presentation	***Erik M. Imathiu-Jones***	Application of Holoraumy to 10 and 11D Supergravity Theories	Sylvester Gates *Ford Foundation Professor of Physics, Brown University* Christopher J. Campbell *Harry Bateman Instructor of Mathematics*
Oral Presentation	***Nissia D. Indradjaja*** Pasadena City College *VURP Fellow*	Exoplanet Discovery From Microlensing Event OGLE-2015-BLG-1726	James W. Fuller *Assistant Professor of Theoretical Astrophysics* Przemyslaw Mroz *Postdoctoral Scholar in Astronomy*
Oral Presentation	***Ethan P. Jaszewski*** *Larson Scholar*	GPU Accelerated Variability Detection	Matthew J. Graham *Research Professor of Astronomy* Dmitry Duev *Research Scientist in Astronomy*
Poster Presentation	***Jenny Ji*** *John Stauffer SURF Fellow*	Quantitative Analysis of the Human Small Intestinal Microbiome	Rustem F. Ismagilov *Ethel Wilson Bowles and Robert Bowles Professor of Chemistry and Chemical Engineering* Jacob Barlow *Graduate Student in Bioengineering*
Oral Presentation	***Abigail Y. Jiang*** *W.H. Halpenny SURF Fellow*	Developing Physical Lab Infrastructure for Thin Film Material Growth and Evaluation	Joseph L. Falson *Assistant Professor of Materials Science*
Poster Presentation	***Samir I. Johnson*** *Flintridge Foundation SURF Fellow*	Using Stars and Polarized Radio Emission to Map the Galactic Magnetic Field	Anthony C. Readhead *Robinson Professor of Astronomy, Emeritus* Clive Dickinson *Visiting Associate in Astronomy*
Poster Presentation	***Benjamin V. Juarez***	Detecting Election Fraud With Machine Learning in Bolivia	R. Michael Alvarez *Professor of Political and Computational Social Science*
Oral Presentation	***Calle W. Junker*** *Frank W. Wood SURF Fellow*	Determination of the Turbulent Flame Speed Scaling for Hydrogen Combustion	Guillaume Blanquart *Professor of Mechanical Engineering* Guillaume Beardsell *Graduate Student in Mechanical Engineering*

Oral Presentation	***Jaeyoung Kang*** *Philip Laipis in Memory of Professor Jerome Vinograd SURF Fellow*	A Predictive Model for the Lactate-Pyruvate Ratio in Cerebral Edema Cases Using Gradient-Boosting Techniques	Jefferson W. Chen *Professor of Neurological Surgery, University of California, Irvine* Yu-Chong Tai *Anna L. Rosen Professor of Electrical Engineering and Mechanical Engineering*
Oral Presentation	***Sara A. Kangaslahti***	Understanding the Evolution of the #MeToo Movement Over Time Using Topic Models	Anima Anandkumar *Bren Professor of Computing and Mathematical Sciences* Anqi Liu *Postdoctoral Scholar in Computing and Mathematical Sciences*
Oral Presentation	***Rohit Kantipudi*** *John Stauffer SURF Fellow*	Investigating the In-Vitro Dynamics of High Intensity Focused Ultrasound Mediated Interactions Between Bacterial Gas Vesicles and Mammalian Tumor Cells Using Ultra High Frame Rate Microscopy	Mikhail G. Shapiro *Professor of Chemical Engineering; Investigator, Heritage Medical Research Institute* Avinoam Bar-Zion *Postdoctoral Scholar in Chemical Engineering*
Oral Presentation	***Johanna S. Karras*** *Arjun Bansal ('05) and Ria Langheim SURF Fellow*	Comparing Regularized Maximum Likelihood and Deep Neural Networks Methods for Black Hole Imaging	Katherine L. Bouman *Assistant Professor of Computing and Mathematical Sciences and Electrical Engineering; Rosenberg Scholar* He Sun *Postdoctoral Scholar in Computing and Mathematical Sciences*
Poster Presentation	***Catherine F. Kauber***	Identifying Protein Products and Inhibitors to Target the 2019 Novel Coronavirus	Ashish Mahabal *Lead Computational and Data Scientist, Caltech Center for Data-Driven Discovery* Nitin K. Singh *Postdoctoral Scholar in Chemistry*
Oral Presentation	***Esther S. Kim*** *Robb and Eunice Rutledge SURF Fellow*	Novel Immune Checkpoint Candidates and Their Ability to Inhibit T-cells	Hansoo Park *Professor of Genomic Medicine Lab, Gwangju Institute of Science and Technology*
Oral Presentation	***Lily Z. Kitagawa*** *Mary Vodopia SURF Fellow*	Individual Differences in Implicit Emotion Processing on Human Faces	Shinsuke Shimojo *Gertrude Baltimore Professor of Experimental Psychology* Shao-Min Hung *Postdoctoral Scholar in Biology and Biological Engineering*

Oral Presentation	***Alexandra P. Klipfel*** *Larson Scholar*	RF Transduction by Biogenic Magnetite via Anisotropic Hysteresis	Joseph L. Kirschvink *Nico and Marilyn Van Wingen Professor of Geobiology* Isaac A. Hilburn *Applications Development Associate in Geology and Geochemistry*
Oral Presentation	***Viktor S. Koehlin Lovfors***	Investigating the Spin Evolution of Neutrons Under a Magnetic Field and Confining Geometry	Brad W. Filippone *Francis L. Moseley Professor of Physics* Chris Swank *Research Assistant Professor of Physics*
Oral Presentation	***Patryk T. Kozlowski*** *John Stauffer SURF Fellow*	Elucidating Catalysis With the "Gold Standard" of Quantum Chemistry	Garnet K. Chan *Bren Professor of Chemistry* Yang Gao *Graduate Student in Materials Science*
Oral Presentation	***Anthony J. Kukavica*** *Samuel N. Vodopia and Carol J. Hasson SURF Fellow*	Income Targeting and the Labor Supply of Rideshare Driver-Partners	Colin F. Camerer *Robert Kirby Professor of Behavioral Economics*
Oral Presentation	***Sanjana G. Kulkarni*** *James H. Milovich SURF Fellow*	Engineering Hepatitis C Virus Immunogens for Increased Binding Affinity for Broadly Neutralizing Antibody Precursors	Pamela J. Bjorkman *David Baltimore Professor of Biology and Bioengineering* Andrew Flyak *Postdoctoral Scholar in Biology and Biological Engineering*
Oral Presentation	***Vinayak M. Kumar*** *Stephen Adelman Memorial SURF Fellow*	Pseudobinomiality of the Sticky Random Walk	Venkatesan Guruswami *Professor of Computer Science, Carnegie Mellon University* Chris M. Umans *Professor of Computer Science*
Oral Presentation	***Shwetha S. Kunnam*** *Robert K. and Alice L. Roney SURF Fellow*	Improved Extraction Methods for Neural Features for Use in Brain Machine Interface	Azita Emami *Andrew and Peggy Cherng Professor of Electrical Engineering and Medical Engineering; Investigator, Heritage Medical Research Institute* Benyamin Haghi *Graduate Student in Electrical Engineering*

Oral Presentation	***Shalini Kurinchi-Vendhan***	Exploring the Early Death of Galaxies With Cosmological Simulations	Michaela Hirschmann *Assistant Professor, Niels Bohr Institute, University of Copenhagen* Charles L. Steinhardt *Associate Professor, Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen* Philip F. Hopkins *Professor of Theoretical Astrophysics*
Oral Presentation	***Thomas A. Kwa*** *Carl F. Braun SURF Fellow*	Towards Formalization of a Distributed Computing Language	Alex Aiken *Professor of Computer Science, Stanford University* Elliott Slaughter *Associate Staff Scientist, Stanford University* Chris M. Umans *Professor of Computer Science*
Poster Presentation	***Charlotte S. LaFayette***	Integers Representable as Sums of Tetrahedral Numbers	Dinakar Ramakrishnan *Taussky-Todd-Lonergan Professor of Mathematics*
Oral Presentation	***Joshua H. Lee***	Particle-Laden Flow	Guillaume Blanquart *Professor of Mechanical Engineering* Joseph Ruan *Graduate Student in Mechanical Engineering*
Oral Presentation	***Lin L. Lee*** *Hannah Bradley SURF Fellow*	Improving Lower Bounds for Linear Size Additive Spanners and Shortcutting Sets	Virginia Williams *Steven and Renee Finn Career Development Associate Professor of Mathematics, Massachusetts Institute of Technology* Thomas G. Vidick *Professor of Computing and Mathematical Sciences*
Oral Presentation	***Laura L. Lewis***	Implementing Remote-State Preparation on a Noisy-Intermediate Size Quantum Device	Thomas G. Vidick *Professor of Computing and Mathematical Sciences* Alexandru Gheorghiu *Postdoctoral Scholar in Computing and Mathematical Sciences*

Oral Presentation	***Anna X. Li*** *Professor Fredrick H. Shair* *SURF Fellow*	Understanding Photoassembly and Oxygen Evolution in Photosystem II Through Molecular Dynamics	Woodward W. Fischer *Professor of Geobiology* William A. Goddard III *Charles and Mary Ferkel Professor of Chemistry, Materials Science, and Applied Physics* John S. Magyar *Research Scientist in Geobiology* Soo-Kyung Kim *Director, Biomacromolecular Modeling Center*
Oral Presentation	***Sophie H. Li*** *Robert L. Blinkenberg* *SURF Fellow*	Monte Carlo Simulations of Electron and Phonon Thermalization in Graphene at the Diffusive-Ballistic Crossover Point	Michael L. Roukes *Frank J. Roshek Professor of Physics, Applied Physics, and Bioengineering* Raj M. Katti *Graduate Student in Physics*
Oral Presentation	***Erich Liang*** *Manit M. Limlamai* *SURF Fellow*	Blackhole Video Reconstruction With Particle Filtering	Katherine L. Bouman *Assistant Professor of Computing and Mathematical Sciences and Electrical Engineering; Rosenberg Scholar* Aviad Levis *Postdoctoral Scholar in Computational and Mathematical Sciences*
Oral Presentation	***Yuying Lin*** *Dr. Chandler C. Ross* *SURF Fellow*	Modelling the Vibrational Relaxation of O_2 Behind a Shock Wave	Guillaume Blanquart *Professor of Mechanical Engineering*
Oral Presentation	***Jianbang Liu*** *Larson Scholar*	Shedding Light Upon a Gigantic Cell: How Patterned Illumination Affects Caulerpa's Growth	Elliot M. Meyerowitz *George W. Beadle Professor of Biology; Investigator, Howard Hughes Medical Institute* Eldad Afik *Postdoctoral Scholar in Biology and Biological Engineering*
Oral Presentation	***Xiaoqi Long***	Deep Complex Networks Using Polar Representation and Multiplicative Update Method	Anima Anandkumar *Bren Professor of Computing and Mathematical Sciences* Yujia Huang *Graduate Student in Electrical Engineering*
Oral Presentation	***Rohan O. Lopez*** Pomona College *Google Quantum WAVE Fellow*	Simulations of Electric Fields in the Channel of a High Electron Mobility Transistor	Austin J. Minnich *Professor of Mechanical Engineering and Applied Physics* Tomi Esho *Graduate Student in Materials Science*

Oral Presentation	***Julen Lujambio*** *John Stauffer SURF Fellow*	Automated Data Extraction of Chemical Literature	Sarah E. Reisman *Professor of Chemistry; Investigator, Heritage Medical Research Institute* Michael Maser *Graduate Student in Chemistry*
Oral Presentation	***Samuel M. Lushtak*** *Carl F. Braun SURF Fellow*	Developing and Publishing Statistical Models of the COVID-19 Pandemic	Yaser S. Abu-Mostafa *Professor of Electrical Engineering and Computer Science*
Oral Presentation	***Sonali Madisetti***	Simulating Chemical Cross-Talk in High Density Enzymatic Biosensors	Michael L. Roukes *Frank J. Roshek Professor of Physics, Applied Physics, and Bioengineering* Jessica L. Arlett *Staff Scientist in Condensed Matter Physics*
Oral Presentation	***Alan L. Maida*** University of California, Berkeley *Carl F. Braun WAVE Fellow*	Small Hot Spot Ignition Study	Joseph E. Shepherd *C.L. "Kelly" Johnson Professor of Aeronautics and Mechanical Engineering* Silken Jones *Graduate Student in Aerospace*
Oral Presentation	***Ananth V. Malladi*** *John Stauffer SURF Fellow*	Extending Ring Polymer Molecular Dynamics Rate Theory to the Marcus Inverted Regime of Electron Transfer	Thomas F. Miller *Professor of Chemistry* Xuecheng Tao *Graduate Student in Chemistry*
Oral Presentation	***Scott R. Martin*** University of Maryland College Park *GROWTH SURF Fellow*	Classifying Transient Sources With Novel Filters	Andrew Connolly *Professor of Astronomy, University of Washington* John B. Kalmbach *Postdoctoral Research Associate in Astronomy, University of Washington*
Oral Presentation	***Kevin A. Marx*** *Sampson Carlson SURF Fellow*	Low-Power Bluetooth Core Body Temperature Sensor for Constant Temperature Monitoring	Azita Emami *Andrew and Peggy Cherng Professor of Electrical Engineering and Medical Engineering; Investigator, Heritage Medical Research Institute* Aryan Hashemi *Graduate Student in Electrical Engineering*
Oral Presentation	***John M. Maxfield*** *The Aerospace Corporation SURF Fellow*	Quantum Proofs of Space	Thomas G. Vidick *Professor of Computing and Mathematical Sciences*

Oral Presentation	***Amritavarshini R. Mayavaram***	Dispersed Pressure Sensing for Flow Field Estimation	Mory Gharib *Hans W. Liepmann Professor of Aeronautics and Bioinspired Engineering* Peter I. Renn *Graduate Student in Aerospace*
Oral Presentation	***Gavin M. McCabe*** *Shirley and Carl Larson SURF Fellow*	Machine Learning Based Morphological Classification of Type-Ia Supernova Host Galaxies	Syed Uddin *Postdoctoral Fellow, Carnegie Observatories* Paul W. Sternberg *Bren Professor of Biology*
Oral Presentation	***Austin S. McCoy*** *Dr. and Mrs. James M. Kendall SURF Fellow*	Bayesian Inferencing PNT Estimation System	Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL* Anthony Fragoso *Staff Scientist in Aerospace*
Poster Presentation	***Kyle A. McGraw***	Surgical Risk Calculator: Predictive Modeling of Surgical Outcomes	R. Michael Alvarez *Professor of Political and Computational Social Science*
Oral Presentation	***Krish A. Mehta***	Development of Template Matching Algorithm for Simultaneous Estimation of Pose and Shape Algorithm Lidar Initialization and Scale Solving	Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL* Vincenzo Capuano *Postdoctoral Scholar in Aerospace*
Poster Presentation	***Hayward J. Melton*** *Captain Pradeep B. Suklikar Memorial SURF Fellow*	Analysis and Design of Novel Integrated 3D Magnetometers in CMOS for Position Sensing	Azita Emami *Andrew and Peggy Cherng Professor of Electrical Engineering and Medical Engineering; Investigator, Heritage Medical Research Institute* Saransh Sharma *Graduate Student in Electrical Engineering*
Oral Presentation	***Liana N. Merk*** *Samuel P. and Frances Krown SURF Fellow*	Complex Rumen Microbiome Assembly Driven By Strain-Level Dynamics	Benjamin H. Good *Assistant Professor of Applied Physics, Stanford University* Richard M. Murray *Thomas E. and Doris Everhart Professor of Control and Dynamical Systems and Bioengineering*
Poster Presentation	***Arya N. Mevada*** *John Stauffer SURF Fellow*	Automated Data Extraction From Chemistry Literature Using Natural Language Processing and Optical Structure Recognition	Sarah E. Reisman *Professor of Chemistry; Investigator, Heritage Medical Research Institute* Michael Maser *Graduate Student in Chemistry*

Oral Presentation	***Prashanth Mohan***	CT Airway Segmentation Using Cascaded 2D U-Net Neural Networks	Albert Hsiao *Assistant Professor of Radiology, University of California, San Diego* Judith L. Campbell *Professor of Chemistry and Biology*
Oral Presentation	***Noah P. Moran*** *Kiyo and Eiko Tomiyasu SURF Scholar*	Enhancements of Scanning Magnetic Microscopy (SQUID) Data Inversion Using Nanotechnology and Real-Time Noise Cancellation Techniques	Joseph L. Kirschvink *Nico and Marilyn Van Wingen Professor of Geobiology* Isaac A. Hilburn *Applications Development Associate in Geology and Geochemistry*
Oral Presentation	***Basel M. Mostafa***	Not All Galaxies Look Like the Milky Way: Reevaluating the Star-Forming Main Sequence With a More Realistic Model of the Universe	Charles L. Steinhardt *Associate Professor, Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen*
Oral Presentation	***Siqiao Mu***	SAIR Epidemic Dynamics on Group-Structured Networks	Mason A. Porter *Professor of Mathematics, University of California, Los Angeles* Franca Hoffmann *von Karman Postdoctoral Instructor in Mathematics*
Poster Presentation	***Arundhati Mukherjea*** *Mark Reinecke SURF Fellow*	Homomorphisms of Braid Groups and Mapping Class Groups of Surfaces	Lei Chen *Noether Instructor in Mathematics*
Oral Presentation	***Maya A. Mutic*** *Marcella Bonsall SURF Fellow*	Improved Thompson Sampling for Linear Quadratic Control	Anima Anandkumar *Bren Professor of Computing and Mathematical Sciences* Zongyi Li *Graduate Student in Computing and Mathematical Sciences*
Oral Presentation	***Thien Vy Nguyen*** Pasadena City College *VURP Fellow*	Searching for Tidally-Induced Stellar Pulsations From Exoplanets	James W. Fuller *Assistant Professor of Theoretical Astrophysics* Przemyslaw Mroz *Postdoctoral Scholar in Astronomy*
Oral Presentation	***Sandra O'Neill*** *Jack and Edith Roberts SURF Fellow*	A Search for Infant Radio Galaxies	Anthony C. Readhead *Robinson Professor of Astronomy, Emeritus* Sebastian Kiehlmann *Postdoctoral Scholar, Institute for Astrophysics*

Oral Presentation	***Patrick L. Orman*** University of Alabama at Birmingham	SYK & Holography: Study of the Sachdev-Ye-Kitaev Model on Sparse Graphs and Small-World Networks	John P. Preskill *Richard P. Feynman Professor of Theoretical Physics* Hrant Gharibyan *IQIM Postdoctoral Scholar in Theoretical Physics*
Oral Presentation	***Lucas L. Pabarcius*** Wesleyan University *KNI SURF-the-WAVE Prize Fellow*	Finite Element Analysis of Arthropod and Scorpion Exoskeleton Inspired Composite Microstructures	Julia R. Greer *Ruben F. and Donna Mettler Professor of Materials Science, Mechanics, and Medical Engineering* Jane Zhang *Graduate Student in Mechanical Engineering*
Poster Presentation	***Chase E. Pagon***	Using Machine and Deep Learning Approaches to Improve the Estimation of Social Media Geographic Locations	R. Michael Alvarez *Professor of Political and Computational Social Science*
Oral Presentation	***Alexander Y. Pan*** *Joanna Wall Muir SURF Fellow*	Decode-Verify: A Tree-to-Tree Neural Network With Model Interpretability	Anima Anandkumar *Bren Professor of Computing and Mathematical Sciences* Forough Arabshahi *Postdoctoral Associate in Computer Science, Carnegie Mellon University*
Oral Presentation	***Mayank Pandey*** *Samuel P. and Frances Krown SURF Fellow*	On an Analogue of the Titchmarsh Divisor Problem	Maksym Radziwill *Professor of Mathematics*
Oral Presentation	***Eunice H. Park***	Discovering Genetic Signatures of Human Blood Cells	Wei Wei *Andy Hill CARE Distinguished Researcher and Assistant Professor, Institute of Systems Biology* Jared R. Leadbetter *Professor of Environmental Microbiology*
Oral Presentation	***Jolly Patro*** *William N. Lacey SURF Fellow*	Applications of Magnetic Co/C Hybrid ROMP-Derived Boronic Acids as Diol Protecting Groups in Polyol Synthesis	Paul Hanson *Professor of Chemistry, University of Kansas* Gihan Dissanayake *Graduate Student in Chemistry, University of Kansas*
Oral Presentation	***Elijah G. Paul***	A Fundamentally New Approach to Designing Optical Filters With Random Nanoparticle Films	Harry A. Atwater *Howard Hughes Professor of Applied Physics and Materials Science*

Oral Presentation	***Joshua G. Pawlak*** *Carol Carmichael SURF Fellow*	Predicting Interannual Sea Surface Temperature Anomaly Using Historical Tide Gauge Records	Mark A. Merrifield *Endowed Chair in Climate Change Impacts and Adaptation, Scripps Institute of Oceanography* Benjamin Hamlington *Scientist, JPL*
Poster Presentation	***Toussaint M. Pegues***	Development of Powered Ankle Exoskeleton and Cane-Assisting Device	Aaron D. Ames *Bren Professor of Mechanical and Civil Engineering and Control and Dynamical Systems*
Oral Presentation	***Joseph J. Peterson*** University of Minnesota	In Silico Circuit Evolution	Richard M. Murray *Thomas E. and Doris Everhart Professor of Control and Dynamical Systems and Bioengineering* Rory L. Williams *Graduate Student in Bioengineering*
Oral Presentation	***Jack D. Pierson***	Investigation of ETF Pairs and Implications in ETF Pairs Trading	Vladimir Cherkassky *Professor of Electrical and Computer Engineering, University of Minnesota* R. Michael Alvarez *Professor of Political and Computational Social Science*
Oral Presentation	***Amanda Piyapanee***	Linking Neural Activity and Synaptic Clusters of Oscillatory Behaviors in the Leech	Daniel A. Wagenaar *Research Professor of Biology and Biological Engineering* Pegah Kassraian-Fard *Postdoctoral Scholar in Biology and Biological Engineering*
Oral Presentation	***Max Popken***	Creating New Features for COVID-19 Case, Death, and Hospitalisation Predictions	Yaser S. Abu-Mostafa *Professor of Electrical Engineering and Computer Science*
Oral Presentation	***Anastasia N. Popova***	Understanding Light-Induced Active Matter Mixing Through Machine Learning	Matthew W. Thomson *Assistant Professor of Computational Biology; Investigator, Heritage Medical Research Institute*
Oral Presentation	***Sarida Pratuangtham*** *John Stauffer SURF Fellow*	Algorithms to Identify Oxysterol Binding Pockets in Proteins	Alison E. Ondrus *Assistant Professor of Chemistry* Yu-Shiuan Cheng *Postdoctoral Scholar Research Associate in Chemistry*

Oral Presentation	***Zihao Qi***	Flat Bands on Honeycomb Superlattices	Yi Li *Assistant Professor of Physics, Johns Hopkins University* Jason F. Alicea *Professor of Theoretical Physics*
Oral Presentation	***Kavya A. Rajagopalan***	Using Toehold-Mediated Strand Displacement to Construct Oscillations in a Magnetic Panel System	Michael Brenner *Michael T. Cronin Professor of Applied Mathematics, Harvard University* Erik Winfree *Professor of Computer Science, Computation and Neural Systems, and Bioengineering*
Poster Presentation	***Malia T. Rebollo*** *Arthur E. Lamel Memorial SURF Fellow*	A Comparison of Accumulator-Based and Register-Based RISC Architectures	Glen A. George *Teaching Professor of Electrical Engineering*
Oral Presentation	***Jacob G. Ressler-Craig***	A Small Primes p-Converse to a Theorem of Gross-Zagier, Kolyvagin, and Rubin	Ashay Burungale *Scott Russell Johnson Research Assistant Professor of Mathematics*
Oral Presentation	***Darren B. Rhodes***	NTopology Software and Mid-Sole Project	Hongbing Lu *Professor of Mechanical Engineering, University of Texas, Dallas* Guruswami Ravichandran *John E. Goode, Jr., Professor of Aerospace and Mechanical Engineering*
Oral Presentation	***Michael I. Rose*** *John Stauffer SURF Fellow*	Comparing Reaction Mechanism for Nitrogen Reduction on Different Ruthenium Catalyst Surfaces	William A. Goddard III *Charles and Mary Ferkel Professor of Chemistry, Materials Science, and Applied Physics* Soonho Kwon *Postdoctoral Scholar in Chemistry*
Oral Presentation	***Joshua R. Rosenberg***	An FPGA Architecture for a Kalman Filter-Based Neural Decoder	Azita Emami *Andrew and Peggy Cherng Professor of Electrical Engineering and Medical Engineering; Investigator, Heritage Medical Research Institute* Sahil Shah *Postdoctoral Scholar in Electrical Engineering*

Oral Presentation	***Daniel V. Rostovtsev***	A Partial Classification of Iota Complexes: Understanding Knot Concordance and Homology Cobordism	Ian Zemke *Instructor of Mathematics, Princeton University* Yi Ni *Professor of Mathematics*
Poster Presentation	***Sabrina Rui*** *Edward W. Hughes SURF Fellow*	Social Analysis of a Virtual Reality World	Santiago V. Lombeyda *Senior Computational Scientist in the Center for Data-Driven Discovery* S. George Djorgovski *Professor of Astronomy; Director, Center for Data-Driven Discovery*
Oral Presentation	***Rafael Jose D. Santiago*** *David C. Elliot SURF Fellow*	Reinforcement Learning and Investor Behavior in Financial Markets	Lawrence Jin *Assistant Professor of Finance*
Poster Presentation	***Eve L. Schoen*** Massachusetts Institute of Technology	Characteristics and Impacts of Far Side Lobe Features of the BICEP Array 1 Telescope	James J. Bock *Professor of Physics; Senior Research Scientist, JPL* Ritoban Basu Thakur *Postdoctoral Scholar in Physics*
Oral Presentation	***Louise E. Schul***	Microcontroller Approach to Mossbauer Spectrometry	Brent T. Fultz *Barbara and Stanley R. Rawn, Jr., Professor of Materials Science and Applied Physics* Cullen M. Quine *Graduate Student in Materials Science*
Poster Presentation	***Jerome J. Seebeck*** *Hannah Bradley SURF Fellow*	Time-Series High-Resolution Spectroscopic Variations of Outbursting Pre-Main Sequence Stars	Lynne Hillenbrand *Professor of Astronomy*
Oral Presentation	***Anish Senapati***	Conditional Value-at-Risk Constrained Optimization	Jose Blanchet *Professor of Management Science and Engineering, Stanford University* Thomas Y. Hou *Charles Lee Powell Professor of Applied and Computational Mathematics*
Oral Presentation	***Archie Shahidullah***	Smart Error Messages for Data Structure Implementations via Codified ADTs	Adam Blank *Teaching Assistant Professor of Computing and Mathematical Sciences*
Oral Presentation	***Lorenzo F. Shaikewitz***	Development of a Powered Ankle Exoskeleton	Aaron D. Ames *Bren Professor of Mechanical and Civil Engineering and Control and Dynamical Systems*

Oral Presentation	***Zhengyuan Shang*** *Class of '36 SURF Fellow*	Construction of Hecke Characters for Three-Dimensional CM Abelian Varieties	Matthias Flach *Professor of Mathematics*
Oral Presentation	***Jason Shi***	Determining Outcomes of Cooperative Games With and Without Externalities	Kevin Tang *Professor of Electrical and Computer Engineering, Cornell University* Federico M. Echenique *Allen and Lenabelle Davis Professor of Economics*
Poster Presentation	***Olivine Silier*** *Lynn A. Booth and Kent Kresa SURF Fellow*	Structural Szemeredi-Trotter Theorem for Lattices	Adam Sheffer *Professor of Mathematics, City University of New York, Baruch College* Nets H. Katz *International Business Machines Professor of Mathematics*
Oral Presentation	***Olivine Silier*** *Lynn A. Booth and Kent Kresa SURF Fellow*	Structural Szemeredi-Trotter Theorem for Lattices	Adam Sheffer *Professor of Mathematics, City University of New York, Baruch College* Nets H. Katz *International Business Machines Professor of Mathematics*
Poster Presentation	***Aditya D. Sivakumar*** *Victor Neher SURF Fellow*	Quantum Error Correcting Codes for Large Spins	John P. Preskill *Richard P. Feynman Professor of Theoretical Physics* Victor Albert *Lee A. DuBridge Postdoctoral Scholar in Theoretical Physics*
Oral Presentation	***Shiva A. Sreeram***	Simultaneous Estimation of Pose and Shape Rotation Filter	Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL* Kai Matsuka *Graduate Student in Aerospace*
Oral Presentation	***Aubrey J. Stevens*** *Ernest R. Roberts SURF Fellow*	Automated Image Processing Pipeline for Fluorescent Microscopy Images	Mitchell Guttman *Professor of Biology; Investigator, Heritage Medical Research Institute* Joanna W. Jachowicz *Postdoctoral Scholar in Biology and Biological Engineering*

Oral Presentation	***Kristina A. Stoyanova***	Characterization of Human Genome Regulatory Regions Using Convolutional Neural Networks and LSTMs	Ron Weiss *Professor of Biological Engineering, Massachusetts Institute of Technology* Matthew W. Thomson *Assistant Professor of Computational Biology; Investigator, Heritage Medical Research Institute*
Oral Presentation	***Christian J. Stromberger*** *Lester Lees Aeronautics SURF Fellow*	The Effect of Length to Height Ratio on Thrust Produced by a Caudal Fin	Mory Gharib *Hans W. Liepmann Professor of Aeronautics and Bioinspired Engineering* Cecilia Huertas Cerdeira *Research Engineer in Aerospace*
Poster Presentation	***Alexandra M. Stutt*** *John and Barbara Gee SURF Fellow*	Motion Planning for Hybrid Locomotion Robots	Joel W. Burdick *Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering and Bioengineering; Research Scientist, JPL* Anushri Dixit *Graduate Student in Control and Dynamical Systems*
Oral Presentation	***Victoria L. Su*** *James C. Whitney SURF Fellow*	Designing a Magnetic Lens to Collimate a Molecular Beam for Larger Signals in the Search for Symmetry Violations	Nick R. Hutzler *Assistant Professor of Physics* Ashay Patel *Graduate Student in Physics*
Oral Presentation	***Jessica J. Sun*** *Harry B. Gray SURF Fellow*	Predicting Solubility Between Proteins and Small Molecules Through Transfer Learning	Stephen L. Mayo *Bren Professor of Biology and Chemistry*
Oral Presentation	***Rachel M. Sun*** *Toni and Bob Perpall SURF Fellow*	Self-Assembly Metamaterial With Aperiodic Microstructures	Chiara Daraio *Professor of Mechanical Engineering and Applied Physics* Ke Liu *Postdoctoral Scholar in Mechanical and Civil Engineering*
Oral Presentation	***Sharne S. Sun*** *Arthur R. Adams SURF Fellow*	The Chemical Logic of Input Integration in Third-Order Fly Olfactory Neurons	Elizabeth J. Hong *Clare Booth Luce Assistant Professor of Neuroscience* Thomas O'Connell *Graduate Student in Neurobiology*
Oral Presentation	***Nathan T. Suri Jr*** *Mellon Mays SURF Fellow*	Search for Quirk Pair Production via a Standalone Reconstruction Algorithm	Maria Spiropulu *Shang-Yi Ch'en Professor of Physics*

Oral Presentation	***Isabel F. Swafford*** *Carolyn Ash SURF Fellow*	Mining Extremely Deep Spectral Images of the Distant Universe	Charles C. Steidel *Lee A. DuBridge Professor of Astronomy*
Oral Presentation	***Madeleine C. Swint*** *Dr. Terry Cole SURF Fellow*	Factors Influencing Urban Wildfire in the Los Angeles Basin	William F. Deverell *Director, Huntington-USC Institute on California and the West*
Oral Presentation	***Yuchen Tang*** *Taylor W. Lawrence SURF Fellow*	Conductance of an Integer Quantum Hall Edge Proximitized by a Superconductor	Jason F. Alicea *Professor of Theoretical Physics* Christina Knapp *DuBridge Postdoctoral Scholar in Theoretical Physics*
Oral Presentation	***Kaden R. Taylor***	Using Geant4 to Simulate Propagation of Quirks in the CMS Detector	Maria Spiropulu *Shang-Yi Ch'en Professor of Physics*
Oral Presentation	***Zane W. Taylor*** *Donald S. Clark SURF Fellow*	Origins of Luster in Bottger Lusterware	Katherine T. Faber *Simon Ramo Professor of Materials Science* Celia Chari *Graduate Student in Materials Science*
Oral Presentation	***Anna T. Tifrea*** *Edward W. Hughes SURF Fellow*	Modeling the Diffusion Within the GV-gel Drug Delivery Platform	Mikhail G. Shapiro *Professor of Chemical Engineering; Investigator, Heritage Medical Research Institute* Paulene Abundo *Graduate Student in Chemical Engineering*
Oral Presentation	***Justin I. Toyota***	A Local Proof of the Jacquet-Langlands Correspondence	Christopher J. Campbell *Harry Bateman Instructor of Mathematics*
Oral Presentation	***Albert Tseng*** *Samuel P. and Frances Krown SURF Fellow*	Utilizing Conflicting Domain Knowledge in Reinforcement Learning	Yisong Yue *Professor of Computing and Mathematical Sciences* Adith Swaminathan *Microsoft Corporation*
Oral Presentation	***Shu Fay Ung*** *John Stauffer SURF Fellow*	Spin-Symmetry Restored Many-Body Perturbation Theory	Garnet K. Chan *Bren Professor of Chemistry* Chong Sun *Graduate Student in Chemistry*
Oral Presentation	***Matthew J. Valdez*** Pasadena City College *Carl F. Braun WAVE Fellow*	The Barrel Timing Layer's Design and Performance of the MIP Timing Detector for CMS Phase-2 Upgrade	Maria Spiropulu *Shang-Yi Ch'en Professor of Physics*

Poster Presentation	***Maxwell S. Vale*** *Howell N. Tyson, Sr., SURF Fellow*	Analyzing Fukushima Blast Waves and Gas Flow Using Background Oriented Schlieren	Joseph E. Shepherd *C.L. "Kelly" Johnson Professor of Aeronautics and Mechanical Engineering* Conor Martin *Graduate Student in Aerospace*
Oral Presentation	***Lorenzo X. Van Munoz*** *Mellon Mays SURF Fellow*	Influence of Substrate Curvature on Dynamic Cone Formation in Electrified Liquids by Finite Element Modeling	Sandra M. Troian *Professor of Applied Physics, Aeronautics, and Mechanical Engineering* Nicholas White *Graduate Student in Applied Physics*
Oral Presentation	***Aditi T. Venkatesh*** *BaBar SURF Fellow*	A TEve Based Event Display for Mu2e	David G. Hitlin *Professor of Physics*
Oral Presentation	***Polina A. Verkhovodova*** *Doris Everhart SURF Fellow*	Applications of Conductive Hybrid Hydrogels in Drug Delivery Systems: A Review	Xuanhe Zhao *Professor of Mechanical Engineering, Massachusetts Institute of Technology* Guruswami Ravichandran *John E. Goode, Jr., Professor of Aerospace and Mechanical Engineering*
Oral Presentation	***Adrienne R. Vescio*** Arizona State University	Exoplanets in Multi-Star Systems	Calen Henderson *Exoplanet Archive Scientist in IPAC* Julian C. van Eyken *Exoplanet Archive Scientist in IPAC*
Oral Presentation	***Yasmin S. Veys*** *Øistein and Rita A. Skjellum SURF Fellow*	Using Deep Reinforcement Learning to Learn Full-Body Mobile Manipulation in Simulation	Silvio Savarese *Professor of Computer Science, Director of SAIL-Toyota Center for AI Research, Stanford University* Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL*
Oral Presentation	***Jagath Vytheeswaran***	Predicting the Spread of COVID-19 Using Artificial Intelligence	Yaser S. Abu-Mostafa *Professor of Electrical Engineering and Computer Science*
Oral Presentation	***James D. Walker*** *Toshi Kubota Aeronautics SURF Fellow*	Integration of Distribute Multi-Agent Localization for Large-Scale Swarm Formation Flying	Soon-Jo Chung *Bren Professor of Aerospace; Research Scientist, JPL* Kai Matsuka *Graduate Student in Aerospace*

Oral Presentation	***Jenny T. Wan*** *Robert L. Blinkenberg SURF Fellow*	Measuring H_0 Using X-ray and SZ Observations of Galaxy Clusters	Steven Allen *Professor of Physics, Stanford University* Adam Mantz *Research Scientist in Astrophysics, Stanford University* Sunil Golwala *Professor of Physics*
Oral Presentation	***Alexander Z. Wang***	Structural and Functional Correlates of Imaginative Suggestibility	Michael Lifshitz *Postdoctoral Fellow in Anthropology, Stanford University*
Oral Presentation	***Yinghan Wang*** *Richard T. Jones SURF Fellow*	Systematic Assessment of Genome Assemblies (SAGA) for Synthetic Genomes	Kaihang Wang *Assistant Professor of Biology and Biological Engineering*
Oral Presentation	***Jack R. Warren***	Synthetic Phase Contrast MRI for Deep Learning Reconstruction	Shreyas S. Vasanawala *Professor of Radiology; Director of MRI, Stanford Children's Hospital* Matthew J. Middione *Research Scientist in Radiology, Stanford University* Brian M. Stoltz *Professor of Chemistry*
Poster Presentation	***Thomas K. Waters*** University of Washington *GROWTH SURF Fellow*	An All-Sky Infrared Variables Catalog From Palomar Gattini-IR	Kishalay De *Graduate Student in Astrophysics* Meredith Rawls *Research Scientist in Astronomy, University of Washington*
Oral Presentation	***Mitchell J. Watson*** *Robert I. and Winifred E. Gardner SURF Fellow*	Level-Set Discrete Element Method (LS-DEM) Verification of Macroscopic and Inter-Particle Properties of Granular Materials Under Shear Stress	Guruswami Ravichandran *John E. Goode, Jr., Professor of Aerospace and Mechanical Engineering* Zichen Gu *Graduate Student in Mechanical Engineering*
Oral Presentation	***Katie K. Wong*** *Dr. and Mrs. Daniel C. Harris SURF Fellow*	Generating Domain Representations for Functional Gas Vesicle Proteins Using Hidden Markov Models	Mikhail G. Shapiro *Professor of Chemical Engineering; Investigator, Heritage Medical Research Institute* Robert C. Hurt *Graduate Student in Neurobiology*
Oral Presentation	***David H. Wu*** *Dr. Jane Chen SURF Fellow*	Many-Body Quantum Systems in Ratchet Potentials	Gil Refael *Taylor W. Lawrence Professor of Theoretical Physics*

Poster Presentation	***Brit L. Wylie*** *Class of '52 60th Reunion SURF Fellow*	Computer Vision Analysis of Time-Dependent Shock-Wave/ Boundary-Layer Interactions in Hypersonic Flow	Joanna M. Austin *Professor of Aerospace* Joel Lawson *Graduate Student in Aerospace*
Oral Presentation	***Tianwei Yin*** University of Texas at Austin	Sequential Sampling for Accelerated Magnetic Resonance Imaging	Yisong Yue *Professor of Computing and Mathematical Sciences* He Sun *Postdoctoral Scholar in Computing and Mathematical Sciences*
Oral Presentation	***Hantao Yu*** University of California, San Diego	Discrete Fourier Transform on Schurrian Schemes	Chris M. Umans *Professor of Computer Science*
Oral Presentation	***Jennifer Yu*** *George and Norma Ruptier SURF Fellow*	Using Computer Vision Analysis to Detect Hand-Stimming in Home Videos for Diagnosis of Pediatric Autism	Dennis Wall *Associate Professor of Pediatrics and Biomedical Data Science, Stanford University* Lior S. Pachter *Bren Professor of Computational Biology and Computing and Mathematical Sciences*
Oral Presentation	***Qiyao Yu***	The BSD Conjecture: p-Converse Theorem for Special Primes	Ashay Burungale *Scott Russell Johnson Research Assistant Professor of Mathematics*
Oral Presentation	***Shuyue Yu***	Recovering the Forgotten Sonorine Recordings	Adam Finkelstein *Professor of Computer Science, Princeton University* Adam C. Wierman *Professor of Computing and Mathematical Sciences*
Oral Presentation	***Elizabeth S. Yunerman*** University of California, Santa Cruz	Exploring Planet Formation by Simulating Dust-Gas Fluid Instabilities	Philip F. Hopkins *Professor of Theoretical Astrophysics*
Oral Presentation	***Christian Zapata-Sanin***	Computer-Aided-Design and Internal Condition Regulation for Synthetic Cells in TX-TL Using CelloCAD and BioCRNpyler	Richard M. Murray *Thomas E. and Doris Everhart Professor of Control and Dynamical Systems and Bioengineering*

Oral Presentation	***Albert J. Zhai*** *Carl F. Braun SURF Fellow*	Learning Visually-Guided Latent Actions for Controlling Assistive Robots	Dorsa Sadigh *Assistant Professor of Computer Science, Stanford University* Dylan Losey *Postdoctoral Scholar in Computer Science, Stanford University* Anima Anandkumar *Bren Professor of Computing and Mathematical Sciences*
Oral Presentation	***Isabella J. Zhang*** *Rita A. and Øistein Skjellum SURF Fellow*	Transfer Learning for Mouse Behavior Annotation	Pietro Perona *Allen E. Puckett Professor of Electrical Engineering*
Oral Presentation	***Yantian Zhang*** *Nellie Bergen and Adrian Foster Tillotson SURF Fellow*	Pseudoentropy and Log Space Computation	Chris M. Umans *Professor of Computer Science*
Oral Presentation	***Emily Zheng***	Interactive Robot Feedback System for Stroke Rehabilitation	Laurel Riek *Associate Professor of Computer Science and Engineering, University of California, San Diego* Aaron D. Ames *Bren Professor of Mechanical and Civil Engineering and Control and Dynamical Systems*
Oral Presentation	***Daniel C. Zhou*** *William H. and Helen Lang SURF Fellow*	Irreducible Characters of GSp(4) Over Finite Rings	Dinakar Ramakrishnan *Taussky-Todd-Lonergan Professor of Mathematics*
Oral Presentation	***Selina Zhou*** *Class of '52 SURF Fellow*	Molecular Sensing With Cascaded Half-Harmonic Optical Parametric Oscillator	Alireza Marandi *Assistant Professor of Electrical Engineering and Applied Physics* Mingchen Liu *Graduate Student in Electrical Engineering*
Oral Presentation	***Fangyu N. Zou*** *Samuel and Berta Spalter SURF Fellow*	Understanding Contrail Parameterizations in Linear Contrail Models	Yuk L. Yung *Professor of Planetary Science; Senior Research Scientist, JPL*