



National Science Foundation
WHERE DISCOVERIES BEGIN

DIVISION OF CHEMISTRY | CHE

NSF 2021

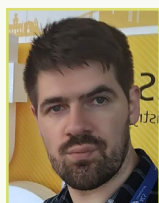
CHE CAREER AWARDEES

2021 CHE CAREER AWARDEES

Congratulations to the NSF/CHE 2021 CAREER Awardees!

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the NSF's most prestigious awards in support of junior Faculty who exemplify the role of teacher-scholar through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations. Such activities should build a firm foundation for a lifetime of leadership in integrating education and research.

We hereby recognize the NSF/CHE CAREER Awardees, Class of 2021!



ALEXEY AKIMOV
University at Buffalo

Award Number:
2045204 (CTMC)

Title:
CAREER: Toward Reliable Nonadiabatic
Dynamics in Condensed Matter and
Nanoscale Systems



JEANINE AMACHER
Western Washington University

Award Number:
2044958 (CLP)

Title:
CAREER: The Stereochemical Basis
of Target Selectivity Encoded by
Specificity-Determining Loops in
Peptide-Binding Domains



JESSICA M. ANNA
University of Pennsylvania

Award Number:
2047614 (CSDM-A)

Title:
CAREER: Elucidating the Interplay
Between Exciton Dynamics and
Symmetry-Breaking Charge Transfer
Through Multidimensional Visible
and Mid-Infrared Spectroscopies



LYNNA G. AVILA-BRONT
College of the Holy Cross

Award Number:
2045012 (CSDM-A)

Title:
CAREER: Understanding the
Formation Mechanism of Binary
SAMs to Create an Experimental
Phase Diagram

**CHRISTOPHER BARILE***University of Nevada-Reno***Award Number:**
2046105 (CAT)**Title:**
CAREER: CAS: Electrocatalytic
Bilayer Interfaces for Controlled
Proton Transport and Tandem
Catalysis**MICHAEL A. BERTUCCI***Lafayette College***Award Number:**
2139898**Title:**
CAREER: Designing Quorum
Sensing Modulators for *Lactobacillus*
plantarum to Probe Interspecies and
Host-Microbe Interactions**MARK S. CHEN***Lehigh University***Award Number:**
2045920 (CSDM-B)**Title:**
CAREER: Exploiting Open-
Shell Character for Organic
Optoelectronic Applications**MING CHEN***Auburn University***Award Number:**
2042353 (SYN)**Title:**
CAREER: Enantioselective Syntheses
of Organoboron Compounds via
Transition-Metal Catalysis**CHRISTINA B. COOLEY***Trinity University***Award Number:**
2045398 (MSN)**Title:**
CAREER: Fluorogenic Radical
Polymerization for Signal
Amplification and Detection**JEFFREY E. DICK***University of North
Carolina-Chapel Hill***Award Number:**
2045672 (MSN)**Title:**
CAREER: Electro-Shock Synthesis
of High Entropy Alloy Nanoparticles
from Sub-Femtoliter Reactors



ELIZABETH ELACQUA
Pennsylvania State University

Award Number:
2046470 (MSN)

Title:
CAREER: Nanoreactors for Dual
Catalysis Under Polymer Confinement



NOÉMIE ELGRISHI
Louisiana State University

Award Number:
2046445 (CSDM-B)

Title:
CAREER: CAS: Confined Nano-
Environments for the Stabilization of
Molecular Electrocatalysts



KEARY ENGLE
The Scripps Research Institute

Award Number:
2046286 (CAT)

Title:
CAREER: Catalytic Activation of
Alkenyl C-H Bonds



JONATHAN J. FOLEY
William Paterson University

Award Number:
2043215 (CTMC)

Title:
CAREER: Computational Design
of Nanophotonic Reagents



JOSEPH A. FOURNIER
Washington University-St. Louis

Award Number:
2044927 (CSDM-A)

Title:
CAREER: Direct Interrogation of
Proton-Coupled Electron Transfer
Reaction Dynamics and Mechanisms
with Cryogenic Ion and Ultrafast
Vibrational Spectroscopies



REBECCA M. GIESECKING
Brandeis University

Award Number:
2046099 (CTMC)

Title:
CAREER: Developing Low-Cost
Computational Models for the
Photoexcited Dynamics of Noble
Metal Nanoclusters

**ROBERT J. GILLIARD***University of Virginia***Award Number:**

2046544 (SYN)

Title:

CAREER: Boracycles with Unusual Bonding as Creative Strategies for Main-Group Functional Materials

**SAMER GOZEM***Georgia State University***Award Number:**

2047667 (CLP)

Title:

CAREER: Shedding Light on the Photochemistry of the LOV Class of Flavin Photoreceptors

**JAMES GRINIAS***Rowan University***Award Number:**

2045023 (CMI)

Title:

CAREER: Parallel Two-Dimensional Liquid Chromatography Utilizing Capillary Columns

**MICHAEL GROVES***California State University-Fullerton***Award Number:**

2048278 (CAT)

Title:

CAREER: Understanding the electrochemical properties of physical hole defects on functionalized B/C 2D materials for the 2e⁻ reduction of O₂ to H₂O₂

**SACHIN HANDA***University of Louisville***Award Number:**

2044778 (CAT)

Title:

CAREER: Understanding Metal-Micelle Cooperativity for Selective Catalysis in Water

**RAÚL HERNÁNDEZ SÁNCHEZ***University of Pittsburgh***Award Number:**

2042423 (MSN)

Title:

CAREER: Tubularenes: a Novel Class of Conjugated Molecular Nanotubes



CALEB M. HILL
University of Wyoming

Award Number:
2045593 (CMI)

Title:
CAREER: Methods for Targeted, High-Throughput Single-Entity Analyses



JAKUB HYVL
University of Hawaii

Award Number:
2046288 (SYN)

Title:
CAREER: Designing Hypervalent Bismuth Complexes with Reactive Perfluorinated Groups for Selective Organofluorination and Expanding Outreach in STEM Education in Hawaii



JIANBING JIANG
University of Cincinnati

Award Number:
2041436 (CAT)

Title:
CAREER: Main-Group Element Catalysis Enabled with Outer Functional Spheres of Molecular Catalysts



MILES W. JOHNSON
University of Richmond

Award Number:
2044834 (CAT)

Title:
CAREER: Study and Design of Modular Aminophosphine Ligands for Cross-Coupling Reactions



JIYEON KIM
University of Rhode Island

Award Number:
2046363 (CMI)

Title:
CAREER: Multimodal Single Entity Electrochemistry at Nanoscale Liquid/Liquid Interfaces



KATHRYN E. KNOWLES
University of Rochester

Award Number:
2044462 (MSN)

Title:
CAREER: CAS: Combining Main Group and Transition Metals to Tune the Electronic Structure, Photophysics, and Photocatalytic Activity of Spinel Oxide Nanocrystals



JOHN A. LATHAM
University of Denver

Award Number:
2042299 (CLP)

Title:
CAREER: Defining the Chemical Contributions of Val29 and Tyr30 in Mycofactocin Biosynthesis for the Development of Novel Redox Molecules



CHRISTINA LI
Purdue University

Award Number:
2045013 (CAT)

Title:
CAREER: CAS: Colloidal Ligand-Exchange Synthesis of Dilute Noble Metal Surfaces for Electrosynthesis of Hydrogen Peroxide



THOMAS LINZ
Wayne State University

Award Number:
2046487 (CMI)

Title:
CAREER: Developing Thermal Gel Electrophoresis to Interrogate Higher Order Biological Structure



GABRIELE MELONI
University of Texas-Dallas

Award Number:
2045984 (CLP)

Title:
CAREER: Plasticity, Promiscuity and Transport Mechanism in Transmembrane Metal Pumps



TRAN B. NGUYEN
University of California-Davis

Award Number:
2046933 (ECS)

Title:
CAREER: Chemistry of the Sulfate Radical Anion in Atmospheric Droplets



CAROLINE PROULX
North Carolina State University

Award Number:
2046681 (SYN)

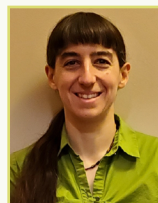
Title:
CAREER: Synthesis of Functional Biomolecules from Tunable N-aryl Peptide Precursors



YI RAO
Utah State University

Award Number:
2045084 (CSDM-A)

Title:
CAREER: Time-Resolved Studies of Charge Transfer and Chemical Reactivity at Photoelectrode-Electrolyte Interfaces



BRENDA RUBENSTEIN
Brown University

Award Number:
2046744 (CTMC)

Title:
CAREER: Finite Temperature Electronic Structure Methods for Predicting Material Phase Diagrams



NIYA SA
University of Massachusetts-Boston

Award Number:
2047753 (CMI)

Title:
CAREER: Probing Interfaces in Energy Storage Materials Using Dynamic Impedance Spectroscopy and Multiharmonic Electrochemical Quartz Crystal Microbalance Dissipation



JAMES SHEPHERD
University of Iowa

Award Number:
2045046 (CTMC)

Title:
CAREER: Developing Wavefunction-Based Quantum Chemistry for Solids



ALEXANDER SOKOLOV
Ohio State University

Award Number:
2044648 (CTMC)

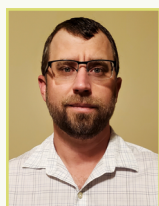
Title:
CAREER: Efficient and Reliable Electronic Structure Theories for Spectroscopic Properties of Strongly Correlated Systems



JOHN R. SWIERK
Binghamton University

Award Number:
2047492 (CSDM-B)

Title:
CAREER: CAS: Mechanistic Investigation of Photoredox Reactions

**MICHAEL TAYLOR***University of Wyoming***Award Number:**
2048201 (CLP)**Title:**
CAREER: Optically Controlled
Protein Proximity Labelling**PRATYUSH TIWARY***University of Maryland-College Park***Award Number:**
2044165 (CTMC)**Title:**
CAREER: Learning to Learn -
Artificial Intelligence Augmented
Chemistry for Molecular Simulations
and Beyond**EMILY TSUI***University of Notre Dame***Award Number:**
2047045 (CSDM-B)**Title:**
CAREER: Formation and
Redox Chemistry of Metal
Polysulfanido Complexes for
Sulfur Transfer Reactions**GAËL UNG***University of Connecticut***Award Number:**
2041084 (CSDM-B)**Title:**
CAREER: CAS: Synthetic Strategies
Towards Modular Lanthanide and
Base-metal Complexes Exhibiting
Strong Circularly Polarized
Luminescence**CASEY R. WADE***Ohio State University***Award Number:**
2044904 (CAT)**Title:**
CAREER: Using Metal-Organic
Frameworks to Harness Molecular
Catalysts for Selective C-H
Functionalization**YIXIAN WANG***California State -Los Angeles***Award Number:**
2045839 (CMI)**Title:**
CAREER: Development of
New Plasmonic Electrochemical
Microscopy Centered Techniques for
Advancing Single Entity Analysis



ZACHARY K. WICKENS
University of Wisconsin-Madison

Award Number:
2047108 (SYN)

Title:
CAREER: Electron-Primed
Photocatalysis as a Platform to Expand
Aryl Radical Reactions



GAYAN B. WIJERATNE
University of Alabama-Birmingham

Award Number:
2045005 (CLP)

Title:
CAREER: Geometric and
Electronic Contributions to
Bio-inspired Reactivities of
Heme-superoxide Intermediates



TAYLOR J. WOEHL
University of Maryland-College Park

Award Number:
2045258 (MSN)

Title:
CAREER: Single Particle
Visualization of Chemical
Processes During Multimetallic
Nanocrystal Synthesis



MICHAEL YOUNG
University of Toledo

Award Number:
2047725 (SYN)

Title:
CAREER: Expanding the Toolbox
for Olefin Functionalization and
Difunctionalization Reactions



JOSEPH M. ZADROZNY
Colorado State University

Award Number:
2047325 (CSDM-B)

Title:
CAREER: Robust Coherence and
High Sensitivity in Metal-Ion Nuclear-
Spin Qubits

CHE Program Abbreviations

Chemical Catalysis – **CAT**

Centers for Chemical Innovation – **CCI**

Chemistry of Life Processes – **CLP**

Chemical Measurement & Imaging – **CMI**

Chemical Structure, Dynamics & Mechanisms A & B – **CSDM A & B**

Chemical Theory, Models & Computational Methods – **CTMC**

Environmental Chemical Sciences – **ECS**

Major Research Instrumentation – **MRI**

Macromolecular, Supramolecular & Nanochemistry – **MSN**

Research Experiences for Undergraduates – **REU**

Chemical Synthesis – **SYN**

The mission of the Division of Chemistry is to promote the health of academic chemistry and to enable basic research and education in the chemical sciences. The Division supports research in all traditional areas of chemistry and in multidisciplinary fields that draw upon the chemical sciences. The Division also supports projects that help build infrastructure, workforce, and partnerships that advance the chemical sciences.



National Science Foundation
WHERE DISCOVERIES BEGIN

DIVISION OF CHEMISTRY

National Science Foundation
2415 Eisenhower Ave, Alexandria, VA 22314

For inquiries, comments or questions, please contact:
Valerie S. Maizel | Program Specialist, NSF/Chemistry
Phone: 703-292-2529 | Email: vmaizel@nsf.gov