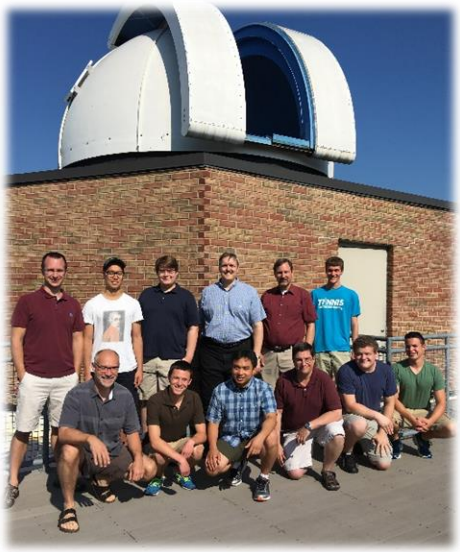
Science Division Summer Research Poster Fair

Friday, October 20, 2017

12:30 pm—3:30 pm

DeVries Hall Atrium

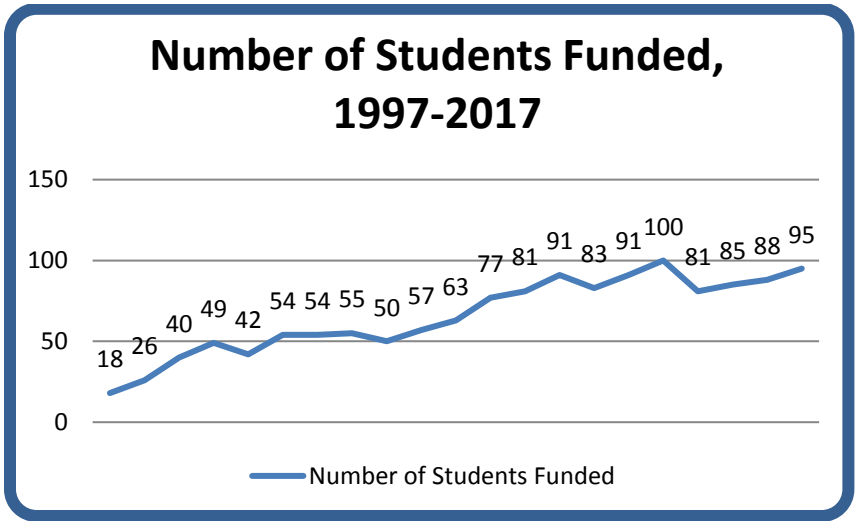


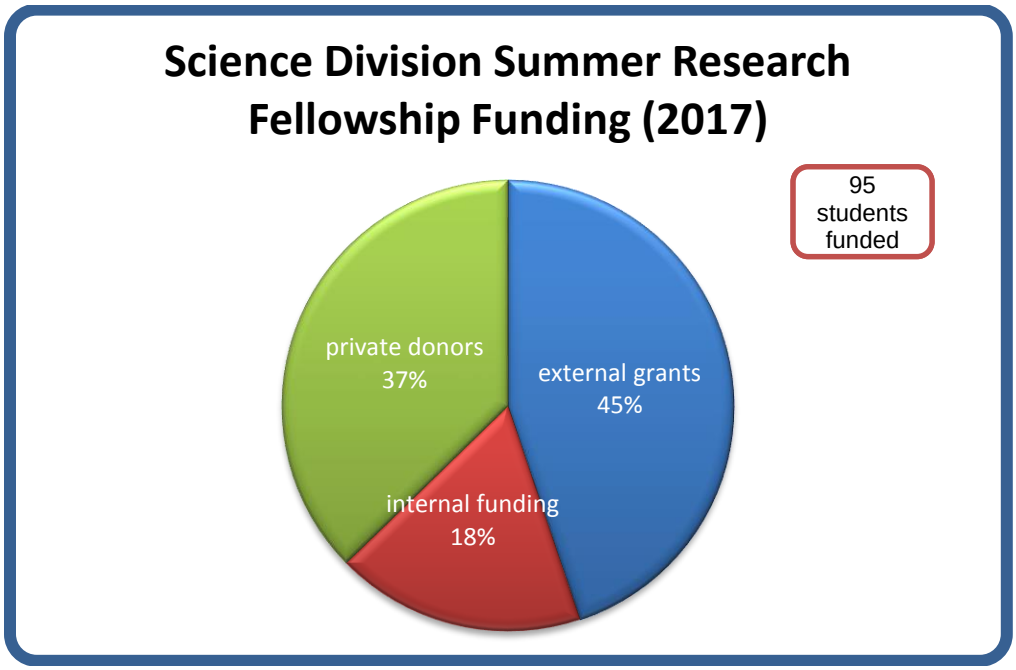
Calvin College 1876

2017 Student Research Conducted in Calvin Science Division Departments

Biology
Chemistry & Biochemistry
Computer Science
Engineering
Geology, Geography & Environmental Studies
Mathematics & Statistics
Physics & Astronomy
Psychology

95 students funded (40 women and 55 men) working with
47 Calvin professors on
64 different projects
45% were externally funded by grants from outside of Calvin College
37% were funded by private donors





Refreshments served on Level 3

2017 Science Division Summer Research Program Funding

The Michael and Cheryl Brandsen Student Research Fellowship
The DeKock Chemistry Summer Research Fellowship
The Thedford P. Dirkse Summer Research Fellowship
The William H. and Celia I. Dornbush DeVries Family Student Research Fellowship
The Rollin M. Gerstacker Foundation Student Research Fellowship
The Dr. Thomas J. Hoogeboom Memorial Research Fellowship in Chemistry and Biochemistry
The Jansma Family Research Fund in the Sciences and Business
The Kallemyn Summer Research Fellowship
The Kanis Summer Research Fellowship
The Bernard Klamer Biology Research Fund
The Bernard Klamer Chemistry Research Fund
The Jack and Lois Kuipers Applied Mathematics Endowment
The Fritz and Carol Rottman Student Research Fellowship
The Harvey Rozema Student Research Fellowship
The Luke and Pauline Schaap Summer Research Fellowship
The Clarence (Bud) Star and Arlene Talen Star Student Research Fellowship
The Henry and Peggy Tazelaar Summer Student Research Fellowship
The John Van Zytveld Summer Student Research Fellowship
The Hubert A. Vander Plas Memorial Student Research Fellowship
The Dr. Daniel J. Visser Student Research Fellowship in the Medical Sciences
The Ken and Marcia Wierda Summer Research Fellowship
The Enno Wolthuis Summer Student Research Fellowship
The Davis Young Research Fellowship in Geology
Calvin College Biology Student Research Fund
Calvin College Alumni Association
Calvin College Clean Water Institute
Calvin College Clean Water Institute-Sawyer Project
Calvin Research Fellows Program
Chemistry Pfizer Fellowship
Program for Sustainability Engineering; gift from Joel and Linda Zylstra
Arnold and Mabel Beckman Scholars Program
Advanced Research Project Administration – Energy (ARPA-E) through Mackinac Technologies Corp.
The Camille and Henry Dreyfus Foundation
The Dragt Family
Mackinac Technologies
Michigan Department of Environmental Quality
Michigan Space Grant Consortium (MSGC)
National Institutes of Health (NIH)
National Science Foundation (NSF)
Spectrum Health SHORA Award
Toyota Motors, North America
Trout Unlimited and the Wege Foundation
U.S. Department of Defense (DOD)
U.S. Fish & Wildlife
U.S. Office of Naval Research

2017 Student Research Conducted Off-Campus

Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland
Lunar and Planetary Institute, Houston, Texas
Michigan State University, Lansing, Michigan
Pierce Cedar Creek Institute, Barry County, Michigan
Purdue University, Lafayette, Indiana
University of Michigan, Ann Arbor, Michigan
Van Andel Research Institute, Grand Rapids, Michigan

Science Division Students Presenting Posters and their Locations

Numbering system:
1-12 indicates Level 1, poster 12; 2-3 indicates Level 2, poster 3, etc. S1 refers to the stairwell between Levels 0 and 1, S2 to the stairwell between Levels 1 and 2, and S3 to the stairwell between Levels 2 and 3

Student	Number and Location	Student	Number and Location
Aardema, Megan	0-1	Kazmierczak, Nathanael	0-3
Althaus, Thomas	0-8	Kim, Jiyoung	3-16
Antuma, Devani	2-3	Kim, Ye Eun (Grace)	0-17
Anumolu, Natalie	2-22	Koning, Elizabeth	S2-2
Apol, Chad	2-16	Lewis, Reuben	1-8
Atma, Jenna	2-21	Lopez, Diana	3-2
Barthel, Gabrielle	S3-2	Madrid, Maia	1-2
Bingle, Amber	2-20	Manni, Gregory	2-5
Blanche, Lyall	3-14	Mason, Miles	0-18
Bleitz, Maria	2-9	Mason, Montana	2-1
Boonstra, Jonathan	0-2	McLain, Kate	3-15
Bootsma, Paul	1-12	Moentmann, Michael	0-6
Bouwman, Rachael	0-12	Nam, Taek Soo	3-14
Brookhouse, Nathan	3-12	Norman, Kelsey	1-4
Chew, Joyce	1-5	Oh, Ye Joo	1-3
Cook, Evan	3-5	Pemberton, Aaron	S3-1
Crow, Elizabeth	1-5	Peterson, Elizabeth	0-13
David, Sarah	S1-4	Peterson, Hannah	0-14
De Almeida, Lorena	2-4	Philipose, Andrew	2-12
DeBruin, Kevin	1-11	Praamsma, Stephanie	2-8
DeVries, Kurtis	1-12	Ramesh, Jesurun	1-7
DeYoung, Maxwell	2-5	Reese, Kalina	S1-3
Doorlag, Jordan	S2-1	Roloff, Emily	0-11
Duff, Kurtis	3-13	Ross, Jackson	0-4
Eikenberry, Araceli	2-8	Rossler, Matthew	0-18
Ervin, Harry	2-2	Samuel, Shiny	3-11
Essenburg, Anna	0-5	Schilthuis, Meghan	2-11
Farrell, Regan	0-20	Scholten, Chace	2-13
Fish, Skyler	2-6	Schumacher, Andrew	0-7
Folkerts, Andrew	0-9	Seper, Brian	3-7
Frndak, Abigail	0-17	Stout, Jacob	3-9
Greaves, Chris	1-9	Strydhorst, Kristin	2-14
Greene, Kenton	3-5	Sugijanto, Daniella	1-10
Haase, Seth	3-14	Sweeney, David	1-3
Hamilton, Katy	0-15	Valentine, Ethan	2-15
Harlow, Olivia	2-10	Van Donselaar, Jenna	2-3
Hazlett, Christiaan	S2-2	Vander Wal, Matthew	0-5
Hilbrands, Adam	0-4	VanKooten, Alex	3-8
House, Rachel	3-1	Ver Beek, Noah	3-10
Hughes, Sarah	2-9	Vincent, Tanner	2-7
Izaguirre, Isaac	S1-1	Vreugdenhil, Kimberly	2-17
Jang, Byoungchan (Chris)	3-6	Walt, Jonathan	2-7
Jang, Hyeong Gyu	0-6	Warners, Rachel	2-9
Jeong, KyuHyun	3-15	Weber, Daniel	1-6
Ji, Pu (Preston)	1-13	Wharton, Janice	S1-2
Joel, Joseph	3-3	Wierenga, Matthew	1-1
Johnecheck, Grace	0-16	Williams, Lorrayya	0-19
Jonker, Patrick	0-10	Wolf, Elysa	0-4
Kalkman, Jacob	2-19	Wolf, Mark	3-4
Kamp, Derrick	2-18	Zerull, Emily	0-18

Calvin College Science Division
Summer Research Poster Fair
October 20, 2017
12:30 – 3:30 p.m.
De Vries Hall Atrium

(Level Zero)

0-1. Author: Megan Aardema
Title: *Assembly Process of the Supramolecular Nanojar*
Advisor: Professor Douglas Vander Griend, Chemistry & Biochemistry
Support: The Enno Wolthuis Summer Student Research Fellowship

0-2. Author: Jonathan S. Boonstra
Title: *Folding Dynamics and Characterization of Beta-Hairpin Peptides*
Advisor: Professor Douglas Vander Griend, Chemistry & Biochemistry
Support: The DeKock Chemistry Summer Research Fellowship

0-3. Author: Nathanael Kazmierczak
Title: *Uncertainty Estimation in Global Analysis of UV-Vis Titration*
Advisor: Professor Douglas Vander Griend, Chemistry & Biochemistry
Support: Arnold and Mabel Beckman Scholars Program

0-4. Authors: Adam Hilbrands, Elysa Wolf, and Jackson Ross
Title: *Protein Oxidation Involved in Cys-Tyr Post-Translational Modification*
Advisor: Professor David Benson, Chemistry & Biochemistry
Support: The Bernard Klamer Chemistry Research Fund, The Luke and Pauline Schaap Summer Research Fellowship, and The Jansma Family Research Fund in the Sciences and Business

0-5. Authors: Matthew Vander Wal and Anna Essenburg
Title: *Progress Toward the Synthesis of Novel Bacterial Topoisomerase Inhibitors Derived from Fluoroquinolones. N-1 Aryl- and Heteroarylamine Derivatives*
Advisor: Professor Michael Barbachyn, Chemistry & Biochemistry
Support: Department of Defense (DOD)

0-6. Authors: Hyeong Gyu Jang and Michael R. Moentmann
Title: *Progress Toward the Synthesis of Novel Bacterial Topoisomerase Inhibitors Derived from Fluoroquinolones. Application of the Suzuki Cross-Coupling Reaction*
Advisor: Professor Michael Barbachyn, Chemistry & Biochemistry
Support: Department of Defense (DOD)

0-7. Author: Andrew Schumacher
Title: *Iron Binding of β-hairpin dopa peptides*
Advisor: Professor Chad Tatko, Chemistry & Biochemistry
Support: The Rollin M. Gerstacker Foundation Student Research Fellowship

0-8. Author: Thomas Althaus
Title: *Protein-Protein Interactions at the Cell Surface, GLUT1 activity and Presence in Human Cell Lines*
Advisors: Professors Eric Arnoys, Brendan Looyenga and Larry Louters, Chemistry & Biochemistry
Support: National Institutes of Health (NIH)

0-9. Authors: Andrew Folkerts, Patrick Jonker and Emily Roloff
Title: *Vesicle and Protein Trafficking in Renal Cancer*
Advisor: Professor Brendan Looyenga, Chemistry & Biochemistry
Support: National Institutes of Health (NIH)

0-10. Author: Patrick Jonker
Title: *Understanding the Minimal Mutational Load for Transformation of Normal Kidney Cells into Renal Cancer Cells*
Advisor: Professor Brendan Looyenga, Chemistry & Biochemistry
Support: The Ken and Marcia Wierda Summer Research Fellowship

0-11. Author: Emily Roloff
Title: *GLUT1 and Osteosarcoma*
Advisors: Professors Brendan Looyenga, Larry Louters and Eric Arnoys, Chemistry & Biochemistry
Support: Spectrum Health SHORA Award

0-12. Author: Rachael Bouwman
Title: *A Study of the Interaction between Insulin and G-Quadruplex DNA*
Advisor: Professor Kumar Sinniah, Chemistry & Biochemistry
Support: The Thedford P. Dirkse Summer Research Fellowship

0-13. Authors: Ellie Peterson, Hannah Peterson and Rachael Bouwman
Title: *A Force Spectroscopy Study of the Binding of Multivalent Dendrimer-Conjugated Vancomycin to a Model Bacterial Surface*
Advisor: Professor Kumar Sinniah, Chemistry & Biochemistry
Support: Calvin College Alumni Grant

0-14. Authors: Hannah Peterson, Elizabeth Peterson and Rachael Bouwman
Title: *Are Mosquito Nets an Effective Substitute for Surgical Mesh in Hernia Repair Surgery?*
Advisor: Professor Kumar Sinniah, Chemistry & Biochemistry
Support: Chemistry Pfizer Fellowship

0-15. Author: Katy Hamilton
Title: *GLUT1 mediated Quercetin uptake*
Advisor: Professor Larry Louters, Chemistry & Biochemistry
Support: National Institutes of Health (NIH)

0-16. Author: Grace Johnecheck
Title: *Investigating Aggregation of GluT1 by Exclusion Chromatography*
Advisors: Professors Larry Louters and Brendan Looyenga, Chemistry & Biochemistry
Support: National Institutes of Health (NIH)

0-17. Authors: A. Katherine Frndak and Ye Eun Kim
Title: *Synthesis of Isoquinoline Alkaloid Derivatives*
Advisor: Professor Carolyn Anderson, Chemistry & Biochemistry
Support: National Science Foundation (NSF)

0-18. Authors: Emily E. Zerull, Matthew D. Rossler and Miles M. Mason
Title: *Propargyloxypyridines as Precursors to Trisubstituted Indolizines*
Advisor: Professor Carolyn Anderson, Chemistry & Biochemistry
Support: National Science Foundation (NSF)

0-19. Author: Lorrayya Williams
Title: *DFT Study of the Effect of Hydrogen Coverage on Propylene Adsorption PtZn Alloy*
Advisors: Dr. Jeff Greeley and Yu-Hsuan Lee (doctoral candidate)
Location: Purdue University, Lafayette, Indiana

0-20. Author: Regan Farrell
Title: *The Chemical Reference Atom: The Role of Fictitious Atomic States in Regards to Electronegativity*
Advisor: Professor Roger DeKock, Chemistry & Biochemistry
Support: The Camille and Henry Dreyfus Foundation

(Stairwell Landing between Levels Zero and One)

S1-1. Author: Isaac Izaguirre
Title: *Investigation of a Second Fluorophore in Sycamores and Other Naturally Occurring Coumarins*
Advisor: Professor Mark Muyskens, Chemistry & Biochemistry
Support: The Kallemyn Summer Research Fellowship

S1-2. Author: Janice Wharton
Title: *Natural Fluorescence of Planetree Extracts*
Advisor: Professor Mark Muyskens, Chemistry & Biochemistry
Support: The Dr. Thomas J. Hoogeboom Memorial Research Fellowship in Chemistry and Biochemistry

S1-3. Author: Kalina Reese
Title: *Elucidating Genotype-Phenotype Connnections in BCS1L Mutations*
Advisors: Professor Rachael Baker, Chemistry & Biochemistry and Professor Amy Wilstermann, Biology
Support: The Jansma Family Research Fund in the Sciences and Business

S1-4. Author: Sarah David
Title: *Combating Antibiotic Resistance with Novel Fluoroquinolone-based compounds*
Advisor: Professor Rachael Baker, Chemistry & Biochemistry
Support: Department of Defense (DOD)

(Level One)

1-1. Author: Matthew Wierenga
Title: *Paleoecology and Taphonomy of the Grassy Mountain Paleoflora (Miocene, Southeastern Oregon)*
Advisor: Professor Ralph Stearley, Geology, Geography & Environmental Studies
Support: The Davis Young Student Research Fellowship in Geology

1-2. Author: Maia Madrid
Title: *The Age of Volcanism North and East of the Aristarchus Crater*
Advisor: Dr. Julie Stopar
Location: Lunar and Planetary Institute, Houston, Texas
Support: NASA

1-3. Authors: Ye Joo Oh and David Sweeney
Title: *Software Tools for Analysis of Data from High-Resolution Animal-Borne Tags*
Advisor: Professor Stacy De Ruiter, Mathematics & Statistics
Support: The Jack and Lois Kuipers Applied Mathematics Endowment and US Office of Naval Research

1-4. Author: Kelsey Norman
Title: *Educational Interactives in Sage*
Advisor: Professor Thomas Scofield, Mathematics & Statistics
Support: The Jack and Lois Kuipers Applied Mathematics Endowment

1-5. Authors: Elizabeth Crow and Joyce Chew
Title: *Characterizing the Gröbner Bases of Generic Ideals*
Advisor: Professor James Turner, Mathematics & Statistics
Support: National Science Foundation (NSF) and The Jansma Family Research Fund in the Sciences and Business

1-6. Author: Daniel Weber
Title: *Active Noise Control with DLMS Algorithm*
Advisors: Professors Richard De Jong and Yoon Kim, Engineering
Support: Mackinac Technologies Corp.

1-7. Author: Jesurun Ramesh
Title: *Reliability Analysis of Drivers for High-Power LEDs*
Advisor: Professor Yoon Kim, Engineering
Support: Calvin Research Fellows Program

1-8. Author: Reuben Lewis
Title: *Modeling and Simulation of a Solar Simulator with Multi-Wavelength High-power LEDs*
Advisor: Professor Yoon Kim, Engineering
Support: Engineering Sustainability Program

1-9. Author: Chris Greaves
Title: *Energy-Saving Alternative for Office Heating*
Advisor: Professor Renard Tubergen, Engineering
Support: Engineering Sustainability Program

1-10. Authors: Daniella Sugijanto, Kevin DeBruin and Chris Greaves
Title: *Cyclical Pressure Testing of Window Inserts*
Advisors: Professors Renard Tubergen and Richard De Jong, Engineering
Support: Toyota Motors, North America

1-11. Authors: Kevin DeBruin and Daniella Sugijanto
Title: *Window Testing Apparatus*
Advisor: Professor Richard De Jong, Engineering
Support: Toyota Motors, North America

1-12. Authors: Paul Bootsma and Kurtis De Vries
Title: *Wind Noise and Mode Shape Analysis*
Advisor: Professor Richard De Jong, Engineering
Support: Advanced Research Project Administration – Energy (ARPA-E) through Mackinac Technologies Corp.

1-13. Author: Pu (Preston) Ji
Title: *Characterization of Iron Oxide Formation Kinetics and Layer Thickness in Aqueous Nitrite Solution Feasibility Study*
Advisor: Professor Steve Pohler, Engineering
Support: Engineering Sustainability Program

(Stairwell Landing between Levels Zero and One)

S2-1. Author: Jordan Doorlag
Title: *ScratchFoot: Transitioning New Programmers from Blocks to Text*
Advisor: Professor Victor Norman, Computer Science
Support: The Kanis Summer Research Fellowship

S2-2. Authors: Elizabeth Koning and Christiaan Hazlett
Title: *Advancing the Thread Safe Graphics Library*
Advisor: Professor Joel Adams, Computer Science
Support: Calvin Research Fellows Program and The Henry and Peggy Tazelaar Summer Student Research Fellowship

(Level Two)

2-1. Author: Montana Mason
Title: *Quantitative Raman Analysis of Drug Distribution in Tissue*
Advisor: Dr. Gus R. Rosania
Location: University of Michigan College of Pharmacy; Rosania Lab
Support: National Science Foundation-Research Experience for Undergraduates (NSF-REU)

2-2. Author: Harry Ervin
Title: *Hungry Hungry… Microbes? Effects of Plant Identity and Nitrogen Availability on Soil Microbes Carbon Consumption*
Advisors: Dr. Sarah Evans and Tayler Chicoine
Location: W. K. Kellogg Biological Station, Michigan State University, Michigan
Support: National Science Foundation-Research Experience for Undergraduates (NSF-REU)

2-3. Authors: Devani Antuma and Jenna Van Donselaar
Title: *Emma Cole Project: A 100-year Reassessment of* Grand Rapids Flora (1901)
Advisor: Professor Dave Warners, Biology
Support: Calvin College Alumni Grant and The Jansma Family Research Fund in the Sciences and Business

2-4. Author: Lorena De Almeida
Title: *Evaluating the effectiveness of curb cut rain gardens in terms of storage volume and sediment removal*
Advisor: Professor Julie Wildschut, Engineering
Support: Engineering Sustainability Program

2-5. Authors: Max De Young and Gregory Manni
Title: *Plant Performance in Curb Cut Rain Gardens*
Advisor: Professor Dave Warners, Biology
Support: Michigan Department of Environmental Quality

2-6. Authors: Skyler Fish and Ben Johnson
Title: *Stormwater Capture via Green Infrastructure in the Plaster Creek Watershed*
Advisors: Professor Dave Warners, Biology and Deanna Geelhoed, Program Coordinator, Plaster Creek Stewards, Biology
Support: Michigan Department of Environmental Quality

2-7. Authors: Jonathan Walt, Stephanie Praamsma and Tanner Vincent
Title: *Mapping Mayapple Growth in Restored Forest*
Advisor: Professor Dave Warners, Biology
Support: The Biology Student Research Fund, The Bernard Klamer Biology Research Fund, and Trout Unlimited and the Wege Foundation

2-8. Author: Araceli Eikenberry
Title: *Green Team - Urban Ecological Restoration*
Advisor: Professor Dave Warners, Biology
Support: The Bernard Klamer Biology Research Fund

2-9. Authors: Maria Bleitz, Sarah Hughes and Rachel Warners
Title: *Great Lakes Restoration Initiative: Reassessment of Wildlife Reproduction and Health Impairments in the Saginaw Bay and River Raisin Areas of Concern and Grand Traverse Bay*
Advisor: Professor Keith Grasman, Biology
Support: Calvin Research Fellows Program and U. S. Fish & Wildlife

2-10. Authors: Olivia S. Harlow, Andrew Philipose, Meghan Schilthuis
Title: *The Roles of Chemokine receptors and intracellular factors in HIV-1 Infection of Resting CD4+ T Cells Stimulated by Endothelial Cells*
Advisor: Professor Anding Shen, Biology
Support: The Clarence (Bud) Star and Arlene Talen Star Student Research Fellowship

2-11. Authors: Meghan Schilthuis, Olivia Harlow and Andrew Philipose
Title: *Lymphatic Endothelial Cells Interact Differently with Memory and Naive Resting CD4+T Cells to Promote HIV-1 Infection*
Advisor: Professor Anding Shen, Biology
Support: National Institutes of Health (NIH)

2-12. Authors: Andrew Philipose, Olivia Harlow and Meghan Schilthuis
Title: *IL6 and CD2 involvement in HIV infection of resting CD4+ T Cells stimulated by Lymphatic Endothelial Cells*
Advisor: Professor Anding Shen, Biology
Support: National Institutes of Health (NIH)

2-13. Authors: Chace Scholten and Kristin Strydhorst
Title: *Are acoustic cues a driver of habitat selection in grassland birds?*
Advisor: Professor Darren Proppe, Biology
Location: Pierce Cedar Creek Institute, Barry County, Michigan
Support: Undergraduate Research Grant for the Environment (URGE)

2-14. Authors: Kristin Strydhorst and Chace Scholten
Title: *Using drones and thermal sensors to locate nests of grassland songbirds*
Advisor: Professor Darren Proppe, Biology
Location: Pierce Cedar Creek Institute, Barry County, Michigan
Support: Undergraduate Research Grant for the Environment (URGE)

2-15. Authors: Ethan C. Valentine and Chad A. Apol
Title: *Small Forest Openings Impact Nest Predation at the Forest Edges*
Advisor: Professor Darren Proppe, Biology
Support: The Biology Student Research Fund

2-16. Authors: Chad Apol and Ethan Valentine
Title: *Impact of Ambient Noise on Acoustic Recording Devices*
Advisor: Professor Darren Proppe, Biology
Support: The Calvin College Biology Student Research Fund

2-17. Author: Kimberly A. Vreugdenhil
Title: *Transposon mutagenesis to determine the basis for symbiosis-supported aerobic growth between termite gut bacteria*
Advisor: Professor John Wertz, Biology
Support: The Harvey Rozema Student Research Fellowship

2-18. Author: Derrick Kamp
Title: *Exploring potential cross feeding and symbiosis factors necessary for growth of a novel Rhizobiales from Cephalotes ants*
Advisor: Professor John Wertz, Biology
Support: National Science Foundation (NSF)

2-19. Author: Jacob Kalkman
Title: *Physiological Study of Common and Glossy Buckthorn's Ability to Outcompete Native Species*
Advisor: Professor David Dornbos, Biology
Support: The Michael and Cheryl Brandsen Student Research Fellowship

2-20. Author: Amber Bingle
Title: *A Decade of Floral Phenology at Flat Iron Lake*
Advisor: Professor Dave Warners, Biology
Support: The Fritz and Carol Rottman Student Research Fellowship

2-21 Author: Jenna Atma
Title: *Effects of Controlled Prairie Burning on Epigeal Arthropod Populations*
Advisor: Professor Randy Van Dragt, Biology
Support: The Fritz and Carol Rottman Student Research Fellowship

2-22 Author: Natalie Anumolu
Title: *Cytokine Release from Extraplacental Membranes and Hemolysis for Five Group B Streptococcus Strains*
Advisor: Professor Erica Boldenow, Biology
Support: The Dr. Daniel J. Visser Student Research Fellowship in the Medical Sciences

(Stairwell Landing between Levels Two and Three)

S3-1. Author: Aaron Pemberton
Title: *Creating High Quality Three-Dimensional Models through Photogrammetry*
Advisor: Professor Ryan Bebej, Biology
Support: The Jansma Family Research Fund in the Sciences and Business

S3-2. Author: Gabrielle Barthel
Title: *Gut microbiota regulate systemic iron homeostasis in mice by modulating intestinal HIF-2α activity*
Advisors: Dr. Nupur Das and Dr. Yatrik Shah
Location: Shah Lab, University of Michigan, Ann Arbor, Michigan
Support: Calvin Biology Department and National Institutes of Health (NIH)

(Level Three)

3-1. Author: Rachel House
Title: *Isolation of CPT1 from Pichia pastoris and murine liver for functional and structural Analysis*
Advisor: Ning Wu, Ph.D.
Location: Van Andel Research Institute
Support: Meijer Foundation

3-2. Author: Diana Lopez
Title: *The Association between Education and All-Cause Mortality among Non-Hispanic Black Men*
Advisor: Dr. Roland J. Thorpe, Jr.
Location: Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland
Support: Diversity Summer Internship Program (DSIP) from the Johns Hopkins Bloomberg School of Public Health Student Affairs Office; Grant #P60MD000214 from the National Institute on Minority Health and Health Disparities of the National Institutes of Health

3-3. Author: Joseph Joel
Title: *Ternary Interactions of Islet Beta Cell Constituents in Aggregation Kinetics*
Advisors: Dr. Ayyalusamy Ramamoorthy and Dr. Kyle Korshavn
Location: University of Michigan Biophysics
Support: University of Michigan Biophysics and miscellaneous grants to lab

3-4. Author: Mark Wolf
Title: *Integrating Data-Driven and Rule-Based Model to Understand Autophagy*
Advisor: Dr. Jeffery MacKeigan, Professor at Michigan State College of Human Medicine
Location: Van Andel Institute, Grand Rapids, Michigan
Support: Meijer Foundation, National Institutes of Health (NIH)

3-5. Authors: Evan Cook and Kenton Greene
Title: *What Can Make a Contact Binary Star Explode?*
Advisor: Professor Larry Molnar, Physics & Astronomy
Support: The Dragt Family and The Hubert A. Vander Plas Memorial Student Research Fellowship

3-6. Author: Byoungchan Jang
Title: *Zeeman Induced Ground State Crossing and Resulting Charge State dynamics*
Advisor: Professor Ryan Balili, Physics & Astronomy
Support: Calvin College Alumni Grant

3-7. Author: Brian C. Seper
Title: *Methylene volumes in monoglyceride bilayers are larger than in liquid alkanes*
Advisor: Professor Paul Harper, Physics & Astronomy
Support: Michigan Space Grant Consortium and The Jack and Lois Kuipers Applied Mathematics Endowment

3-8. Author: Alex VanKooten
Title: *Distinguishing Multiple Populations in Galactic Clusters*
Advisor: Professor Jason Smolinski, Physics & Astronomy
Support: The John Van Zytveld Summer Student Research Fellowship

3-9. Author: Jacob Stout
Title: *Taste Perceptions of Chlorinated Water*
Advisors: Professor Donald J. Tellinghuisen, Psychology and David B. Wunder, Engineering
Support: Calvin College Clean Water Institute

3-10. Author: Noah Ver Beek
Title: *Chlorine Dosing for Rural Community Water Supplies*
Advisor: Professor David Wunder, Engineering
Support: Calvin College Clean Water Institute

3-11. Authors: Shiny Samuel and Nathan Brookhouse
Title: *Addition of Copper to Micron-size Sand Filter*
Advisors: Professor David Wunder, Engineering, and Professor Kelly DuBois, Biology
Support: Calvin College Clean Water Institute

3-12. Author: Nathan Brookhouse and Shiny Samuel
Title: *Biological Testing of an Experimental Slow Sand Filter*
Advisor: Professor Kelly DuBois, Biology and Professor David Wunder, Engineering
Support: Calvin College Clean Water Institute

3-13. Author: Kurtis Duff
Title: *Clean Water in Ecuador*
Advisor: Professor Chad Tatko, Chemistry & Biochemistry
Support: Calvin College Clean Water Institute

3-14. Authors: Lyall Blanche, Seth Haase and Taek Soo Nam
Title: *Geospatial Investigation of Clean Water Indicators in Developing Countries: Liberia*
Advisor: Professor Jason VanHorn, Geology, Geography & Environmental Studies
Support: Calvin College Clean Water Institute

3-15. Authors: Kate McLain and KyuHyun Jeong
Title: *Clean Water for Liberia: Statistical Analysis*
Advisors: Professors Stacy DeRuiter and Randall Pruim, Mathematics & Statistic
Support: Calvin College Clean Water Institute-Sawyer Project

3-16. Author: Emily Lawson, Peter Wagenmaker, Jiyoung Kim
Title: *Modeling for Umm el-Jimal and the Long Term Reuse Project of the Ancient Reservoirs*
Advisor: Professor Robert Hoeksema, Engineering
Support: Calvin College Clean Water Institute