Science Division
Summer Research Poster Fair

Friday, October 17, 2014
12:30 pm—3:30 pm
DeVries Hall Atrium
2014 Student Research Conducted in Calvin Science Division Departments
Biology
Chemistry & Biochemistry
Computer Science
Engineering
Geology, Geography & Environmental Studies
Mathematics & Statistics
Nursing
Physics & Astronomy

2014 Student Research Conducted Off-Campus
Solim Med in Dushanbe, Tajikistan
University of Houston, Houston, Texas
University of Michigan, Ann Arbor, Michigan
University of Missouri, Columbia, Missouri
Wayne State University, Detroit, Michigan

2013 Science Division Summer Research Program Funding
The Andrew Family Foundation
The DeKock Chemistry Summer Research Fellowship
Den Ouden 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 Jansma Family Research Fund in the Sciences and Business
The Jack and Lois Kuipers Applied Mathematics Endowment
Fritz and Carol Rottman Student Research Fellowship
The Harvey Rozema Student Research Fellowship
Luke and Pauline Schaap Summer Research Fellowship
The Clarence (Bud) Star and Arlene Talen Star Student Research Fellowship
Henry and Peggy Tazelaar Summer Student Research Fellowship
The John Van Zytveld Summer Student Research Fellowship
Hubert A. Vander Plas Memorial Student Research Fellowship
The Dr. Daniel J. Visser Student Research Fellowship in the Medical Sciences
The Enno Wolthuis Summer Student Research Fellowship
Biology Department
Chemistry & Biochemistry Department
Geology, Geography & Environmental Studies Department
Brummel Chair
Calvin Alumni Association
Calvin College Eco System Preserve Bunker Endowment
Chemistry Pfizer Fellowship
Program for Sustainability Engineering; gift from Joel and Linda Zylstra
Science Division
Arnold and Mabel Beckman Scholars Program
Cargill Foundation
Environmental Systems Research Institute (Esri)
Plaster Creek Watershed Restoration Project
Michigan Space Grant Consortium (MSGC)
National Institutes of Health (NIH)
National Science Foundation (NSF)
Robert Wood Johnson Foundation
U.S. Fish & Wildlife
2014 Science Division summer research:
81 students funded (42 women and 39 men) working with
39 Calvin professors on
46 different projects
46% were externally funded by grants from outside of Calvin College
38% were funded by private donors

Refreshments served on Level 3
## Science Division Students Presenting Posters and their Locations

<table>
<thead>
<tr>
<th>Student</th>
<th>Number and Location</th>
<th>Student</th>
<th>Number and Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auyeung, Shamuel</td>
<td>32 Level 2</td>
<td>Merz, Lauren</td>
<td>41 between Levels 2 and 3</td>
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<tr>
<td>Ayoola, Ayooluwa</td>
<td>28 Level 1</td>
<td>Michmerhuizen, Anna</td>
<td>1 Level 0</td>
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<tr>
<td>Bell, Abbeigal</td>
<td>4 Level 0</td>
<td>Nanda, Hezkiel</td>
<td>28 Level 1</td>
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<td>Bell, Jedidiah</td>
<td>6 Level 0</td>
<td>Nguyen, Thuy-Nhi</td>
<td>53 Level 3</td>
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<td>Blohm, Laura</td>
<td>19 Level 1</td>
<td>Nguyen, Tran</td>
<td>54 Level 3</td>
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<td>Boersma, Peter</td>
<td>57 Level 3</td>
<td>Noyes, Ian</td>
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<td>Bogner, Allie</td>
<td>3 Level 0</td>
<td>Nwadike, Abuoma</td>
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<td>Bootsma, Andrea</td>
<td>16 between Levels 0 and 1</td>
<td>Oh, Ye In</td>
<td>45 Level 3</td>
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<td>Buteyn, Nate</td>
<td>45 Level 3</td>
<td>Otte, Andre</td>
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<td>Christopher, Joy</td>
<td>14 between Levels 0 and 1</td>
<td>Postma, David</td>
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<td>Cooper, Carl</td>
<td>26 Level 1</td>
<td>Pryor, Michael</td>
<td>30 between Levels 1 and 2</td>
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<td>Crain, Patrick</td>
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<td>Quan, Jenai</td>
<td>40 Level 2</td>
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<td>DeJong, Leanna</td>
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<td>Reidy, Connor</td>
<td>15 between Levels 0 and 1</td>
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<td>DeJonge, Lydia</td>
<td>12 Level 0</td>
<td>Richard, Cassidy</td>
<td>46 Level 3</td>
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<td>DeVries, Jodie</td>
<td>56 Level 3</td>
<td>Rienstra, Mia</td>
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<td>Disselkoen, Kyle</td>
<td>17 between Levels 0 and 1</td>
<td>Rocha, Jeremiah</td>
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<tr>
<td>Ellens, Victoria</td>
<td>29 between Levels 1 and 2</td>
<td>Ruiter, Joshua</td>
<td>32 Level 2</td>
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<td>Ebeye, Tega</td>
<td>29 between Levels 1 and 2</td>
<td>Scholten, Kayla</td>
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<td>Flikweert, Niecia</td>
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<td>Schuiteman, Sam</td>
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<td>Geelhoed, Deanna</td>
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<td>Shin, Soeyeon</td>
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<td>Gingrich, Jonathan</td>
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<td>Shomsky, Jonathan</td>
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<td>Glupker, Courtney</td>
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<td>Sinniah, Ranu</td>
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<td>Hegg, Taylor</td>
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<td>Smit, Kara</td>
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<td>Heidmann, Brian</td>
<td>14 between Levels 0 and 1</td>
<td>Spedden, Christopher</td>
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<td>Hilbrands, Brian</td>
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<td>Stapleton, Abby</td>
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<td>Hooker, Stacy</td>
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<td>Strang, Zachariah</td>
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<td>Hromada, Susan</td>
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<td>Strikwerda, Caitlin</td>
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<td>Hughey, Audrey</td>
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<td>Terschak, Nathan</td>
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<td>Jongekrijg, Megan</td>
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<td>Valk, Josiah</td>
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<td>Kim, SeongEun</td>
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<td>Van Noord, Daniel</td>
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<td>Knott, Jonathan</td>
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<td>Van Winkle, Maggie</td>
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<td>Langeland, Monica</td>
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<td>Vander Stel, Mark</td>
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<td>Lee, Grace HaEun</td>
<td>29 between Levels 1 and 2</td>
<td>Vander Wees, Jesse</td>
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<td>Leisman, Dorthea</td>
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<td>VanOpstall, Calvin</td>
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<td>Leistra, Abby</td>
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<td>Vos, Aimee</td>
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<td>Lin, Jonathan</td>
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<td>Weidman, Jared</td>
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<td>Lodge, Evans</td>
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<td>Zhang, David</td>
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<td>McReynolds, Nathan</td>
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<td>Zylstra, Isaac</td>
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</tr>
</tbody>
</table>
Calvin College Science Division
Summer Research Poster Fair
October 17, 2014
12:30 – 3:30 p.m.
De Vries Hall Atrium

(Level Zero)

1. Authors: Anna Michmerhuizen, Zac Drees, and SeongEun Kim
   Title: The Practical Mathematical Limits of Global Analysis
   Advisor: Professor Douglas A. Vander Griend, Chemistry & Biochemistry
   Support: National Science Foundation (NSF) and The DeKock Chemistry Summer Research Fellowship

2. Author: Jared D. Weidman
   Title: Theoretical Interpretation of Atomic and Ionic Size
   Advisor: Professor Roger L. DeKock, Chemistry & Biochemistry
   Support: The Rollin M. Gerstacker Foundation Student Research Fellowship

3. Authors: Taylor Hegg, Matthew Hollowell, Susan Hromada, and Allie Bogner
   Title: Formation, Function, and Biological Scope of Tyrosine-Cysteine Crosslinking
   Advisor: Professor David Benson, Chemistry & Biochemistry
   Support: National Science Foundation (NSF) and Arnold and Mabel Beckman Scholars Program

4. Authors: Abbey Bell and Niecia Flikweert
   Title: Iodocyclocarbamation Reaction of N-Arylcarbamates: Scope and Limitations
   Advisor: Professor Michael Barbachyn, Chemistry & Biochemistry
   Support: Brummel Chair and The William H. and Celia I. Dornbush DeVries Family Student Research Fellowship

5. Author: Calvin VanOpstall
   Title: Development of Flexible Linker for Validation of NanoLuciferase and mCherry BRET Assays
   Advisor: Professor Brendan Looyenga, Chemistry & Biochemistry
   Support: Chemistry Pfizer Fellowship

6. Author: Jedidiah Bell
   Title: BRET to Explore the Aggregation of GluT1
   Advisors: Professors Larry Louters and Brendan Looyenga, Chemistry & Biochemistry
   Support: The Luke and Pauline Schaap Summer Research Fellowship

7. Author: Evans Lodge
   Title: Glut1 Surface Expression and Activation
   Advisors: Professors Larry Louters, Brendan Looyenga and Eric Arnoys, Chemistry & Biochemistry
   Support: National Institutes of Health (NIH) and the Chemistry Department

8. Author: Aimee Vos
   Title: GLUT1 Abundance in Lipid Rafts
   Advisors: Professors Eric Arnoys, Larry Louters and Brendan Looyenga, Chemistry & Biochemistry
   Support: The Enno Wolthuis Summer Student Research Fellowship

9. Author: Sam Schuiteman
   Title: The Effects of Cell Density on Glucose Uptake in L929 Cells
   Advisors: Professors Eric Arnoys, Larry Louters, and Brendan Looyenga, Chemistry & Biochemistry
   Support: The Thedford P. Dirkse Summer Research Fellowship

10. Author: Mia Rienstra
    Title: LRRK1ing for a Cure
    Advisor: Professor Brendan Looyenga, Chemistry & Biochemistry
    Support: The Enno Wolthuis Summer Student Research Fellowship
11. Authors: Abigail N. Leistra and Kayla J. Scholten  
Title: A Dynamic Force Spectroscopy Study of the Interaction Between G-Quadruplex DNA and Insulin  
Advisor: Professor Kumar Sinniah, Chemistry & Biochemistry  
Support: National Science Foundation (NSF)

12. Authors: Lydia J. DeJonge, Nicole L. Michmerhuizen, Maggie A. Van Winkle and Amanda B. Witte  
Title: A Biophysical Study of the Interaction between Insulin and G-Quadruplex DNA  
Advisor: Professor Kumar Sinniah, Chemistry & Biochemistry  
Support: National Science Foundation (NSF)

13. Author: Maggie Van Winkle  
Title: Characterizing the Binding Interaction between G-Quadruplex DNA and Hexameric Insulin  
Advisor: Professor Kumar Sinniah, Chemistry & Biochemistry  
Support: National Science Foundation (NSF)  
(Stairwell Landing between Levels Zero and One)

14. Authors: Joy Christopher and Brian Heidmann  
Title: Efforts Towards the Synthesis of β- and γ-Amino Acids Containing N-Alkyl Pyridones  
Advisor: Professor Carolyn E. Anderson, Chemistry & Biochemistry  
Support: National Science Foundation (NSF)

15. Author: Connor Reidy  
Title: Microwave Assisted Gold(I)-Catalyzed Rearrangement of N-Propargyloxypyridines  
Advisor: Professor Carolyn E. Anderson, Chemistry & Biochemistry  
Support: National Science Foundation (NSF)

16. Author: Andrea Bootsma  
Title: Exploration into Rotationally Restricted N-Alkyl 2-Quinolones  
Advisor: Professor Carolyn E. Anderson, Chemistry & Biochemistry  
Support: Arnold and Mabel Beckman Scholars Program

17. Author: Kyle Disselkoen  
Title: Quantum Yield and Rate Constants for H/TFAA  
Advisor: Professor Mark Muyskens, Chemistry & Biochemistry  
Support: The Jack and Lois Kuipers Applied Mathematics Endowment  
(Level One)

18. Author: Ranu Sinniah  
Title: Can Arylamines form Covalent Adducts with Abasic Sites in DNA?  
Advisors: Dr. Kent Gates, Mike Catalano  
Location: University of Missouri, Columbia, Missouri. Chemistry Department - Gates Lab  
Support: National Science Foundation (NSF)

19. Authors: Laura Blohm, Zach Hernandez and Teresa Tse  
Title: Understanding the Mirror Neuron System from Freely Behaving Infants via Scalp Electroencephalography  
Advisor: Dr. Jose L. Contreras-Vidal  
Location: Laboratory for Non-Invasive Brain-Machine Interface Systems, University of Houston, Houston, Texas  
Support: National Science Foundation (NSF)

20. Author: Soeyeon Shin  
Title: WHO Quality of Life Survey Comparing Patients with Low Vision and People with Normal Vision in Tajikistan  
Advisor: Dr. Brian Zerbe  
Location: Solim Med in Dushanbe, Tajikistan  
Support: Dr. Brian Zerbe and her parents
21. Author: Ian Noyes  
   Title: *Michigan Brownfield Redevelopment: A Shifting focus from Environmental Contamination to Economic Development*  
   Advisor: Professor Mark Bjelland, Geology, Geography & Environmental Studies  
   Support: Geology, Geography & Environmental Studies Department

22. Authors: Audrey Hughey and Brian Hilbrands  
   Title: *Publishing an Online Ethiopian Geography*  
   Advisor: Professor Johnathan Bascom, Geology, Geography & Environmental Studies  
   Support: The Jansma Family Research Fund in the Sciences and Business and Environmental Systems Research Institute (Esri)

23. Author: Jesse Vander Wees  
   Title: *Air Quality Concerns and Energy Analysis of Bagasse Charcoal*  
   Advisors: Professors David Wunder and Matthew Heun, Engineering  
   Support: Program for Sustainability Engineering

24. Author: Jonathan Gingrich  
   Title: *Bagasse Charcoal: the Potential for Affordable Water Purification in Developing Countries*  
   Advisor: Professor David Wunder, Engineering  
   Support: Program for Sustainability Engineering

25. Author: Jeremiah Rocha  
   Title: *Impact of Antibiotics on Dentrifying Biofilm Bacteria*  
   Advisor: Professor David Wunder, Engineering  
   Support: The Jansma Family Research Fund in the Sciences and Business

26. Author: Carl Cooper  
   Title: *Development of Wireless Energy Monitoring Systems and Smartphone Apps*  
   Advisor: Professor Yoon G. Kim, Engineering  
   Support: Program for Sustainability Engineering

27. Author: Nathan Terschak  
   Title: *Developing Solar Simulator Modules based on High Power LEDs*  
   Advisor: Professor Yoon G. Kim, Engineering  
   Support: Program for Sustainability Engineering

28. Authors: Ayo Ayoola and Hezkiel Nanda  
   Title: *Magnetic Focusing*  
   Advisor: Professor April Si, Engineering  
   Support: The Jansma Family Research Fund in the Sciences and Business

   *(Stairwell Landing between Levels One and Two)*

29. Authors: Megan Jongekrijg, Tori Ellens, Grace HaEun Lee and Tega Ebeye  
   Title: *Preconception Alcohol Consumption Among Low-Income Women*  
   Advisor: Professor Adejoke B. Ayoola, Nursing  
   Support: The Henry and Peggy Tazelaar Summer Student Research Fellowship, Science Division, Calvin Alumni Association and Robert Wood Johnson Foundation

30. Author: Michael Pryor  
   Title: *Characterizing Pain and Activity Levels in Homeless Adults*  
   Advisor: Professor Jesse Moes, Nursing  
   Support: The Jansma Family Research Fund in the Sciences and Business
(Level Two)

31. Authors: Isaac Zylstra and Andrew Hayes  
Title: Sets of Selective Sums of Infinite Series  
Advisor: Professor John Ferdinands, Mathematics & Statistics  
Support: The Jack and Lois Kuipers Applied Mathematics Endowment

32. Authors: Shamuel Auyeung, Joshua Ruiter and David Zhang  
Title: Homotopy of Manifolds  
Advisor: Professor James Turner, Mathematics & Statistics  
Support: National Science Foundation (NSF) and The Jack and Lois Kuipers Applied Mathematics Endowment

33. Authors: Mark Vander Stel and Patrick Crain  
Title: TSGL: A Thread-Safe Graphics Library for Creating Multithreaded Visualizations  
Advisor: Professor Joel Adams, Computer Science  
Support: National Science Foundation (NSF)

34. Author: Patrick Crain  
Title: Open Source Continuum Crowds on the CPU & GPU  
Advisor: Professor Joel Adams, Computer Science  
Support: National Science Foundation (NSF)

35. Author: Zachariah Strango  
Title: The Effects of Mixtures of Lipids DOPE and DSPE on Phase Transitions  
Advisor: Professor Paul Harper, Physics & Astronomy  
Support: The Jack and Lois Kuipers Applied Mathematics Endowment

36. Author: Jonathan Shomsky  
Title: Trapping Krypton and Argon atoms with laser beams  
Advisor: Professor Matthew Walhout, Physics & Astronomy  
Support: National Science Foundation (NSF)

37. Authors: Daniel Van Noord and Chris Spedden  
Title: Prediction of a Luminous Red Nova  
Advisor: Professor Lawrence Molnar, Physics & Astronomy  
Support: The Hubert A. Vander Plas Memorial Student Research Fellowship

38. Authors: Chris Spedden and Dan Van Noord  
Title: An Abrupt Period Change in the Contact Binary Star System V859 Cyg  
Advisor: Professor Lawrence Molnar, Physics & Astronomy  
Support: The John Van Zytveld Summer Student Research Fellowship

39. Author: Nathan McReynolds  
Title: Asteroid Collisional Families By Color  
Advisor: Professor Lawrence Molnar, Physics & Astronomy  
Support: Michigan Space Grant and Science Division

40. Author: Jenai Quan  
Title: Small-Scale Metal Variability in an Urban Garden  
Advisor: Dr. Lawrence D. Lemke  
Location: Wayne State University, Detroit, Michigan  
Support: donation to the Center for Peace and Conflict Studies, directed towards REU programs
41. Author: Lauren E. Merz  
Title: *Post-Exercise Fatigue in Duchenne Muscular Dystrophy*  
Advisor: Daniel E. Michele, Ph.D  
Location: Frankel Cardiovascular Center, University of Michigan, Ann Arbor, MI  
Support: Esperance Family Foundation

42. Author: Erika Steensma  
Title: *Mechanically-activated Nitric Oxide Signaling in Duchenne Muscular Dystrophy*  
Advisor: Dr. Daniel Michele  
Support: Calvin College Biology Department

43. Author: Abigail M. Stapleton  
Title: *Genomic Characterization of Jumbo Bacteriophage Shaista*  
Advisors: Professors Randall J. DeJong and John T. Wertz, Biology  
Support: Office of the Provost

44. Author: Jonathan Y. Lin  
Title: *Physiological Characterization of a Novel Genus of Bacteria Isolated from the Guts of Cephalotes Ants*  
Advisor: Professor John T. Wertz, Biology  
Support: The Harvey Rozema Student Research Fellowship

45. Authors: Nate Buteyn and Ye In Oh  
Title: *Comprehensive Analysis and Outline of Two Introductory Biology Lab Courses*  
Advisors: Professor Herbert R. Fynewever, Chemistry and Professor David S. Koetje, Biology  
Support: Calvin College Biology Department

46. Author: Cassidy Richard  
Title: *The Effect of Prairie Burns on Arthropod Populations at Flat Iron Lake, Kent Co., MI*  
Advisor: Randall Van Dragt, Biology  
Support: The Fritz and Carol Rottman Student Research Fellowship

47. Author: Caitlin Strikwerda  
Title: *Effects of Climate Change on Blooming Times at Flat Iron Lake Preserve*  
Advisor: Professor Dave Warners, Biology  
Support: The Fritz and Carol Rottman Student Research Fellowship

48. Author: Andre Otte  
Title: *Investigation of E. coli Contamination in the Headwaters of Plaster Creek*  
Advisors: Professor Dave Warners, and Mike Ryskamp, Biology  
Support: Plaster Creek Watershed Restoration Project

49. Authors: Jonathan Knott and David Postma  
Title: *Forty Years of Forest Development in the Calvin College Ecosystem Preserve*  
Advisor: Professor Randall Van Dragt, Biology  
Support: Cargill Foundation Grant and Eco System Preserve Bunker Endowment

50. Authors: Deanna Geelhoed and Kara Smit  
Title: *Native Habitats in Urban Landscapes: Prince Prairie on Calvin’s Campus*  
Advisor: Professor Dave Warners, Biology  
Support: Science Division and Biology Department
51. Authors: Stacy Hooker, Monica Langeland and Dorthea Leisman  
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: The Clarence (Bud) Star and Arlene Talen Star Student Research Fellowship and US Fish and Wildlife Service

52. Author: Josiah A. Valk  
Title: *Interpretation of Tail Function in Fossil Cetaceans through Multivariate Analyses of Caudal Vertebrae in Modern Mammals*  
Advisor: Professor Ryan M. Bebej, Biology  
Support: The William H. and Celia I. Dornbush DeVries Family Student Research Fellowship

53. Authors: Thuy-Nhi Nguyen, Sammy Cowell and Leanna DeJong  
Title: *Attracting Songbirds with Conspecific Playback: A Multispecies Approach*  
Advisor: Professor Darren Proppe, Biology  
Support: Science Division and The Andrew Family Foundation

54. Authors: Tran Nguyen, Abouma Nwadike, Jon Morris and Richard Wu  
Title: *Identification of Cytokines that Aid Endothelial Cells in Infection of Resting CD4+ T cells*  
Advisor: Professor Anding Shen, Biology  
Support: National Institutes of Health (NIH)

55. Author: Courtney Glupker  
Title: *Apoptotic pathway and effect of potassium on corneal epithelial cells exposed to UV-B radiation*  
Advisors: Professor John Ubels and Mark Schotanus, Biology  
Support: National Institutes of Health (NIH) and Den Ouden Research Fellowship

56. Author: Jodie DeVries  
Title: *FAS, FADD siRNA knockdown does not prevent UVB activated K+ currents through Kv3.4 in corneal epithelial cells*  
Advisors: Professor Loren Haarsma, Physics & Astronomy and Professor John Ubels, Biology  
Support: Science Division

57. Author: Peter Boersma  
Title: *Identifying the Role of Fas and FADD in UVB Induced K+ Efflux*  
Advisor: Professor John Ubels, Biology  
Support: National Institutes of Health (NIH)