

Celebrate Science!



Scientific activities Goshen College students
engaged in the past year.

Research Programs

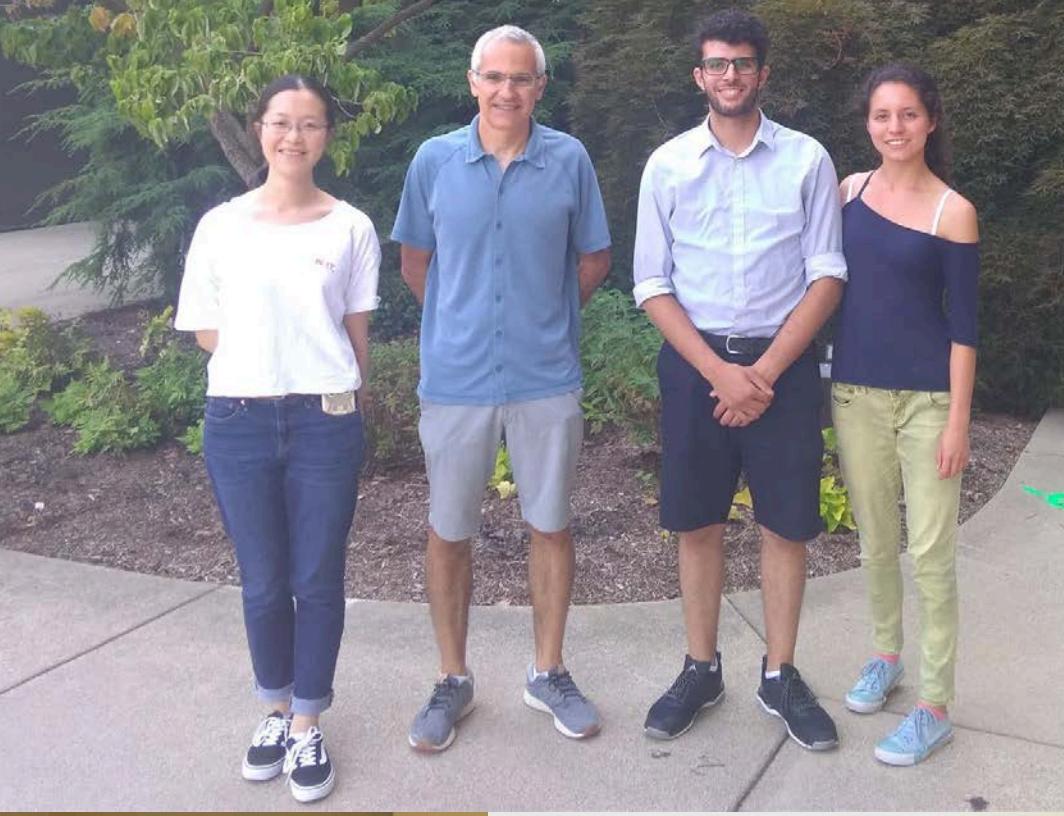


- ❖ Maple Scholars is a Goshen College eight-week program.
- ❖ National Science Foundation Research for Undergraduates (NSF REU) programs are offered at a variety of colleges and universities in a variety of research areas.
- ❖ The Oak Ridge Institute for Science and Education (ORISE) sponsors more than 50 research programs for undergraduate students at national laboratories and other federal research facilities in 24 states and some outside the United States.
- ❖ Universities, governments, and companies have their own research and internship programs.

Dean's Undergraduate Research Fellowship-College of Pharmacy @Purdue University

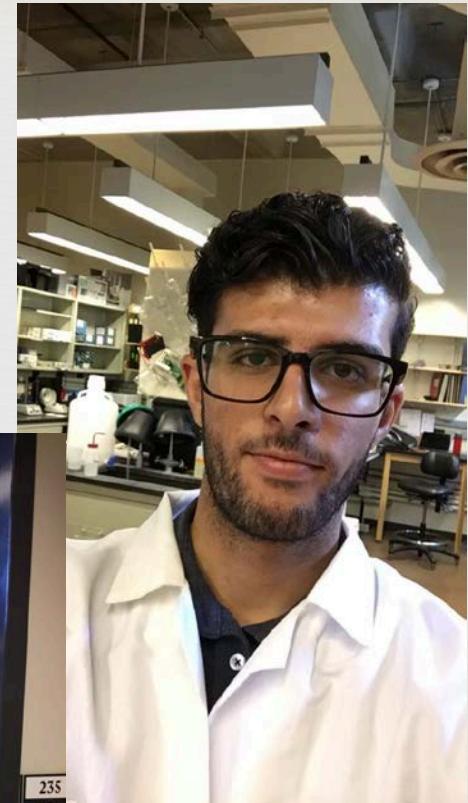


The Department of Medicinal Chemistry and
Molecular Pharmacology
Tony Hazbun Research Group
Yazan Meqbil



Things I did!

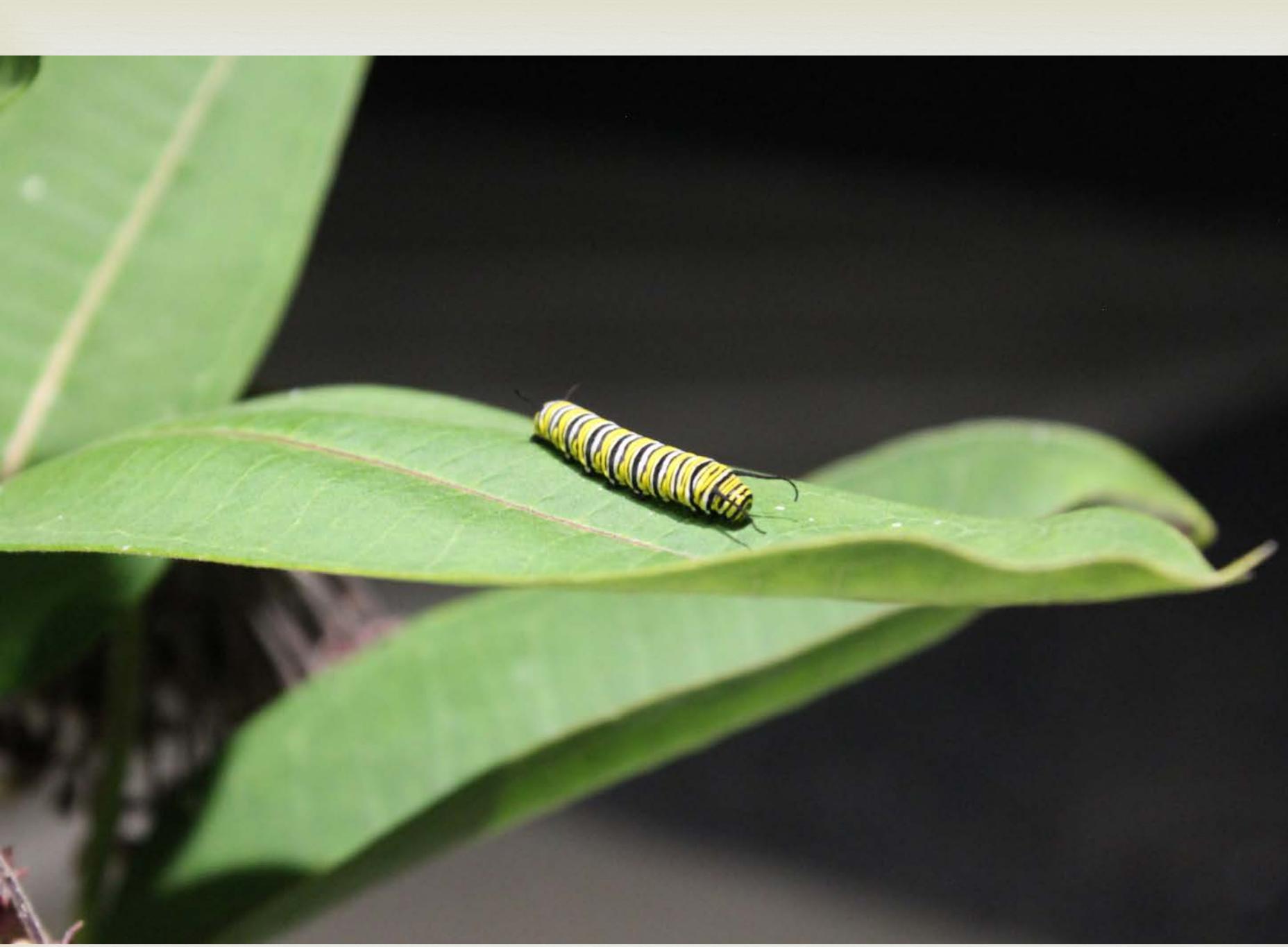
1. The recipient of the College of Pharmacy Dean of Research Summer Undergraduate Research Fellowship.
2. Attended the Midwest Chromatin and Epigenetics Meeting at Purdue University 6/10-6/11.
3. Investigated the role of a methyltransferase, *TaeI*, in the N-terminal methylation of a set of 24 *s. cerevisiae* proteins.
4. Spent 500 hours in lab!



Research Experience for Undergraduates at Blandy Experimental Farm



Geoff Miller







Smithsonian Institution

Division of Birds, Department of Vertebrate Zoology, NMNH

January 2014

The Division of Birds at the national Museum of Natural History (Smithsonian Institution) houses the world's third largest collection of bird specimens, approximately 600,000 to 625,000 specimens. We have over 40,000 specimens on the database with an automatic projector for completing data entry of 10-15 years with appropriate support. Our collections are made up of:

- 50,000 skeletons – the largest avian skeleton collection in the world based both on total count and the number of species represented (ca. 5200)
- 30,000 fluid preserved specimens – the largest collection in the world in terms of the number of individuals and species represented (ca. 4200)
- approximately 500,000 study skins (394,000 on the database)
- approximately 2200 mounted specimens
- approximately 1100 specimens in other preparations
- 33,012 sets of eggs (2138 species represented)
- 4907 nests
- 3871 primary type specimens of birds
- approximately 2200 mounted specimens
- approximately 1100 specimens in other preparations



The Division of Birds annually hosts 150–370 visitors to the collections. We annually process 60 loans of specimens or tissue samples to qualified researchers, students or exhibitions.

A New Specimen of Note:

Our specimen of Lincoln's warbler USNM 8074, a Hudsonian Godwit, is the only known Charles Darwin specimen in North America. It's also one of the few remaining Darwin specimens to still have some of Darwin's original labels attached.

We also have historical records in the collection from such notables as John James Audubon, Alfred Russel Wallace, Teddy Roosevelt and Clarence Birdseye.

The latest specimen in our collection as documented on our database are: USNM 60559 and Gossle, both Euphonia violacea, collected in the spring of 1818 in Brazil. These specimens were retained in 1870 from the Victoria Imperial Museum.

Visit our web site at <http://VertZoo.si.edu> or Birds.si.edu for online public specimen viewing or info requests@si.edu

GENERAL
THE STUDY
COLLECT SKIN
COLLECTION

Maple Scholars



- ❖ Whether it's exploring the relationship between math and music, testing the stress levels of drunk honeybees, or developing curriculum for a criminal justice course at the county jail, each year Goshen College students spend the summer doing intense study and research during the college's eight-week Maple Scholars program.
- ❖ During the program, each scholar is paired with a faculty member who serves as both colleague and supervisor. Creating a community of scholars, the students are all housed together and in the Friday colloquium, scholars take turns presenting the work they are doing and answering questions from other students and faculty. At the end is a celebration day when the results of each project are presented to the public.



❖ **Anja Kenagy**, a senior physics major from Dix Hills, New York, worked with **Paul Meyer Reimer**, professor of physics, on a collaborative project to study the presence and effects of fungal toxins in the diet of infant Tanzanians. Their project looked at the geospatial prevalence of toxins in stores of groundnuts, and will aim to create a predictive model of toxins in the food supply based on environmental factors and using remote sensing techniques. Kenagy and Meyer Reimer aim to identify intervention strategies that could be used to better the situation.



✉ **Nick Schrock**, a junior mathematics and history double major from Goshen, worked with professor of mathematics **David Housman** to research game theory, the mathematical study of situations of conflict and/or cooperation. They researched how to fairly divide things between various interested groups or individuals. One particular application of such research could be voting schemes, where different groups with different interests are given various amounts of representation.



✉ Austin Hooley, a senior physics major from Goshen, and Claude Lilford, a junior film production and creative writing double major from Rustenburg, South Africa, worked with Jessica Baldanzi, associate professor of English, and Jeanette Shown, associate professor of computer science. The group worked on a project titled “AI Meets the Graphic Nerd,” and aimed to create an interactive graphic novel that features, among other things, interactive moving panels. The project integrates work and research Baldanzi has done into graphic novels and research Shown has done into machine learning.



❖ **Isaiah Kaufman**, a sophomore molecular biology/biochemistry major from Goshen, worked with professor emeritus of biology **Stan Grove** on [AlgaeTown](#). The project is one that Goshen students and faculty have been working on together with Formco Inc. in Elkhart over the course of several years, and aims to research how to use Microalgae to more effectively produce biomass as a source of energy, food and other products.



❖ **Morgan Catron**, a senior molecular biology/biochemistry major from Goshen, and **Cailin Smith**, a junior molecular biology/biochemistry major from Knightstown, Indiana, worked with **Andy Ammons**, associate professor of [biology](#), to research the genetics of mosquitos. The group studied the DNA and RNA of mosquitos with the goal of reaching a better understanding of how diseases such as yellow fever and Zika are transmitted and carried. The students aim to generate research suitable for presentation at local or national scientific conferences.

Academic Year Research



- ❖ Some courses have a research component.
- ❖ Often there is academic credit available.
- ❖ Career and graduate study exploration.
- ❖ Resume builder for job applications & graduate school recommendation letters.
- ❖ Pigeon Genetics mentored by Dan Smith: **Danny Aramouni, Tyler Lautenschleger, Jorge Soto, Joe Wheeler**
- ❖ Distributive Drug Discovery mentored by Doug Schirch: **Josh Bustos, Megan Eigsti, Lauren Wenger, Caleb Derstine, Naomi Peters, Zach Ganger, Connor Clemens, Jose Ramirez, and Olivia Wenger**

Internships



- ❖ **Brandon Vires**, Camp Skylemar
- ❖ **Makayla Trout**, Beacon Medical Group
- ❖ **Erin Strock**, Oaklawn Psychiatric Center
- ❖ **Sijan Shrestha**, Save Our Planet
- ❖ **Ethan Francois-Ravalier**, Children, Family, and Young People Services
- ❖ **Delphin Monga**, UniqueAid and Maple City Healthcare Center
- ❖ **Aidan Friesen**, Trees for Goshen

Conferences



❖ Goshen College Academic Symposium

- ❖ **Suetta Miller**, *Effects of Prebiotic Food Consumption and Well-being On Presence of Inhibitory Bacteria in Human Breast Milk*
- ❖ **Danny Aramouni**, *Pigmentation Genetics of the Domestic Pigeon, Columba livia domestica*
- ❖ **Simon D. Weaver**, *Enzyme Kinetics of Invertase by NMR Spectroscopy and Polarimetry with Constants Calculated Using the Lambert-W Function*
- ❖ **Geoff Miller**, *Game Theory Models of Evolution in the Yucca Moth-Yucca Plant Obligate Mutualism and the Cheater Yucca Moth*

❖ Butler Conference

- ❖ **Olivia Wenger, Erin Strock, and Ryan Hartig**, The effect of classical music on the Stroop test
- ❖ **Cheyenne Petty and Mary Seeck**, Embodied cognition: The influence of a stable or unstable environment

❖ Indiana Academy of Science

- ❖ MathFest (Mathematical Association of America)
 - ❖ **Nick Schrock**, Measuring Voting Power Using Observed Data
- ❖ Mathematical Association of America, Indiana Section

Science Speakers



- ❧ **Lydia Miller**, Drivers of modularity in plant-pollinator networks of montane meadows
- ❧ **Mark Krieder**, Effects of forest biological and physical structure on carbon storage in mixed and single-species dominated stands
- ❧ **Joel Gerig**, Using CRISPR-Cas9 to Edit the Genome of *Caenorhabditis elegans*
- ❧ **Brenner Burkholder**, Integrating Community Knowledge: Citizen Science Geography for Researching Flooding and Disaster Management in Hopkins, Belize
- ❧ **Nate O'Leary**, Testing a New Model for Disease Research: Human Kidneys and Stem Cells

Science Olympiad



- Over 100 students, faculty, and community members volunteered to run 23 events for 12 middle school and 12 high school teams on Saturday, February, 10, 2018.
- This year, the Goshen College Regional Tournament will be on Saturday, February 9, 2019.



Contests



- ❖ Association for Computing Machinery Programming Contest (East Central North America Regional):
Mikol Aspinwall, Kenan Bitikofer, Julian Harnish, Esteban Montoya, Nick Schrock, and Bryce Yoder. Ranked 33 out of 134 teams at the Grand Valley site.
- ❖ Putnam Competition: **Julian Harnish** (in the top 19% among 4,638 undergraduates) **Kenan Bitikofer , Lydia Miller, Annie Steiner, and Yedidiya Zewdu.** As a team we ranked 104 out of 574 institutions.



- ❖ The Global Game Jam (GGJ) is the world's largest game creation event taking place around the world at physical locations. In January 2018, 42,800 jammers at 803 jam sites in 108 countries produced thousands of games.
- ❖ Goshen College was one of the sites, drawing people from as far away as Ball State University as well as Goshen College students **Kenan Bitikofer, Bryce Yoder, Christopher Gehman, Nick Walter, Mikol Aspinwall, Phil Chan, Kartikeya Sharma**. This year, the GGJ will be held January 25-27, 2019.

Awards



- ❖ General Chemistry Achievement Award given to the highest achieving students in General Chemistry:
Abby Hochstetler
- ❖ Math Book Awards given to first-year students for outstanding achievement in 200+ level mathematics courses: **Katie Baer** (Calculus III), **Hugh Birk** (Calculus II, Calculus III), and **Joe Harshbarger** (Calculus I, Calculus III)

Scholarships



- ❖ Alicia Showalter Reynolds (women who are considering graduate studies in the sciences):
- ❖ Clemens (upper-level chemistry major):
- ❖ Leaf (academically talented first-generation students majoring in STEM):
Ameera Alshuga, Tyler Lautenschleger, Morgan Catron
- ❖ Mathematics Instructors (mathematics education major):
- ❖ Sarah G. Rody (women majoring in computing or mathematics):

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