



Integrative Physiology

University of Colorado
Boulder

Department
Newsletter

IPHY

Issue #17

Fall 2017

Special points of interest:

- New IPHY building to break ground in July!
- Interested in the science of exercise? Enroll in a free massive online course (MOOC)
- IPHY involved in research to improve the health and well-being of PAC-12 student athletes
- Olympian in our midst!

Inside this issue:

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A Few Words from the Chair by David Sherwood

It is my pleasure to report that IPHY is on the move! We have just heard that the Board of Regents have approved the construction of an addition to the Ramaley building that will house our faculty and staff currently occupying the Carlson Gym space.

Plans call for a three-story addition that would add 22,000-gross-square-feet to Ramaley for an estimated cost of \$21 million. Our research labs in Carlson that study muscle fatigue, cardiovascular aging, and blood-vessel function will all find new homes in the addition that will add about 14,400 assignable square feet of space. The expansion will also include space for two additional labs for new faculty members. Other features of the addition will include a conference room, clinical spaces for interviews and the testing of human subjects, and offices for faculty, post-docs, staff, and graduate students. We appreciate the efforts of the University to develop first-class research facilities for our outstanding faculty.

I am also happy to share with you that we hosted a Student Social on September 14, 2017, in collaboration with the IPHY club. It was a great opportunity for our students to get acquainted with our faculty and staff. The impetus for the event emerged from the fact that we have the largest number of majors of any department on in the College of Arts and Sciences and that can lead to a lack of a sense of community. Participants enjoyed snacks and a number of lawn games including Hamster Balls, Monster Trikes, Top Doc Giant Operation, Golf Challenge, and a Photo Booth. Attendees also earned raffle tickets by participating in the games to win door prizes that included Beats Studio Wireless Headphones, Boulder Bike Tour with Farm to Table Dinner for Two, Boulder Beer Tour for Two, One Night with Breakfast at the Renaissance Boulder Flatirons Hotel, CU Football Tickets, and The Spot Climbing Gym passes.

As usual, we thank our alumni and supporters. Your comments, suggestions, and financial support have contributed to the success of our department. On behalf of IPHY, I wish all IPHY alumni and supporters a wonderful 2018!





Matt McQueen Serves as Research Investigator on Pac-12 Concussion Study

The Pac-12 Conference recently created the Student-Athlete Health and Well-Being Concussion Coordinating Unit (PCCU). This multi-year, multi-site research initiative will establish best practices and clinical infrastructure for advancing education on traumatic brain injury in student-athletes. This will be done through the use of SyncThink EYE-SYNC technology, a world leader in neuro-technology with foundational intellectual property in eye-tracking. This FDA Class II medical device has integrated, head-mounted virtual reality technology capable of recording, viewing and analyzing eye movements in support of identifying visual tracking impairment.

CU Boulder will serve as the coordinating institution for the PCCU in collaboration with the NCAA's [Concussion Assessment Research and Education \(CARE\) Consortium](#). Researchers and staff will be working to establish objective data collection protocols across all Pac-12 Conference member institutions and implementing measurable goals for assessing concussions in student-athletes. The CARE Consortium was jointly created by the NCAA and Department of Defense.

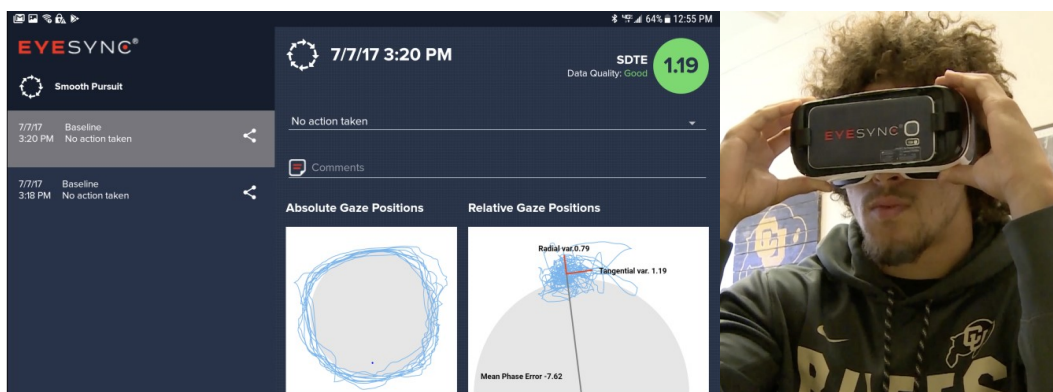
Matthew McQueen, an associate professor of Integrative Physiology, will serve as Director of the PCCU along with investigators Theresa Hernandez of CU Boulder and Dawn Comstock of the CU Anschutz Medical Campus and the Colorado School of Public Health.

As a part of this program, each participating institution will receive two EYE-SYNC® devices to capture objective brain health metrics among its member institutions and to support national research on concussion currently underway within the NCAA.

The far-reaching scope of the study, which will compile years' worth of longitudinal data on the brain health of student-athletes across multiple sports, represents a major step forward in establishing baseline procedures for concussion treatment and addresses a critical issue facing athletes across the country.

All Pac-12 conference members will be phased into the PCCU over a three-year period, with CU Boulder acting as the conference's administrative and operations coordinating unit in order to ensure the proper implementation of the program and data collection system.

CU Boulder to lead Pac-12 research initiative on student-athlete concussions. *CU Boulder Today* (November 16, 2017). <https://www.colorado.edu/today/2017/11/16/cu-boulder-lead-pac-12-research-initiative-student-athlete-concussions>





Science of Exercise MOOC On Track To Be Most Popular in CU History

Whenever CU professor Robert Mazzeo offers “Exercise Physiology,” an upper-level undergraduate course popular with aspiring doctors, it fills quickly (about 230 students each academic year). In June, Bob Mazzeo, a member of the integrative physiology faculty, introduced an online version of the course called “The Science of Exercise” that also has proven popular — on a vastly greater scale and far beyond Boulder.

Two years ago, Mazzeo hadn’t even heard of MOOCs, or massive open online courses. When he did, from Russell Moore, the university provost, Mazzeo seized on the potential for propagating the core message of his teaching and research — that “exercise is medicine” — at an exponentially greater rate than possible on campus. Working with a CU team of learning design experts, Mazzeo condensed and simplified the lectures from his semester-long campus course, shot a series of videos, and developed new quizzes designed to be scored by software or other students in the course. Within months, thousands of people around the world were enrolling in “The Science of Exercise”.

“I’m reaching populations I never thought I’d reach in my career,” said Mazzeo, who marvels over student locations seen from an electronic dashboard on his office computer: Botswana, Qatar, Algeria, Nepal, Iraq, India and scores of others.

Mazzeo’s MOOC covers the same basic concepts as his in-the-flesh course, Exercise Physiology, but it’s not the same course, and isn’t intended to be. The MOOC consists of four modules to be completed at the student’s pace within a 180-day period. It is shorter and less technical, involves fewer and less-detailed tests, and successful completion of the MOOC doesn’t confer CU academic credit.

By early January, more than 60,000 people worldwide had at least sampled the course. A new cohort of students enrolls every two weeks, and there is no cap on enrollment. “Based on the number of new students joining each week, ‘Science of Exercise’ is on track to be the most popular course in the history of CU,” said Cory Pavichich (Engl, Hum’04) of CU’s Office of Strategic Initiatives, which helps faculty design MOOCs.

As an indication from enrollment numbers, it is easy to join. Anyone with an internet connection can participate by visiting a provider website, such as coursera.org, registering, picking a course and clicking the first lesson. For free, learners can watch instructional videos and consume other course materials (readings, quizzes, projects). To be evaluated and eligible for a certificate of completion, students pay a fee of \$49 for “The Science of Exercise”.

Eric Gershwin. MOOC. *Coloradan*, CU Alumni Association Magazine (December 1, 2017). <https://www.colorado.edu/coloradan/2017/12/01/mooc>
Illustration by Harry Campbell





We Welcome Our New Faculty

Mark Opp, Ph.D.

(Washington State University, Pullman), Professor

Dr. Opp's research programs aim to elucidate sleep-immune interactions, specifically the role of chronic insufficient sleep in the etiology of inflammatory disease. Current projects use mouse models to determine mechanisms by which sleep disruption contributes to musculoskeletal pain, traumatic brain injury, and metabolic dysregulation. Results of Dr. Opp's research have been published in *Nature Reviews Neuroscience*; *Glia*; *Brain, Behavior and Immunity*; *SLEEP* and other highly-ranked journals. Dr. Opp is past-President of the Sleep Research Society and of the Psycho-Neuroimmunology Research Society. He is Editor-in-Chief of *Neurobiology of Sleep and Circadian Rhythms*.



Nicole Stob, Ph.D.

(Colorado State University), Instructor

Dr. Stob is an instructor of nutrition for health and performance for the Department of Integrative Physiology, for the Division of Continuing Education, and for the Health Professions Residential Assistance Program. She also teaches clinical nutrition in the Department of Integrative Physiology and, in addition to teaching traditional courses, she also has experience teaching online and hybrid courses.



Céline Vetter, Ph.D.

(Ludwig-Maximilian-University, Munich, DE), Assistant Professor

Dr. Vetter's research spans the fields of circadian rhythms, sleep, occupational health, light, and health. She examines associations between drivers of circadian rhythms and sleep, and health, especially cardio-metabolic health and mood disorders. She uses epidemiological methods and big data sets to identify novel prevention opportunities, and also implements interventions and observational field studies. Dr. Vetter has published in more than 22 peer-reviewed articles in journals including the *Journal of American Medical Association*, *Current Biology*, and *Diabetes Care*, as well as several book chapters. Her research is funded by the National Institutes of Health.





Faculty Fellows Program Supports Development of IPHY Learning Goals by Jia Shi

The ASSETT¹ Faculty Fellows Program supports Arts and Sciences faculty members in sharing ideas and strategies to improve teaching. One of the goals of this program is to motivate educators to share pedagogy in order to reduce duplication of efforts.

During the spring 2017 semester – in the first round of this two-year program, 15 faculty fellows representing 15 individual departments met biweekly. At these meetings, faculty fellows discussed teaching, student learning, technology needs, and challenges within their departments. We shared learning exercises that individual departments had developed for their students. We realized that there are some common concepts that we need to teach students which are independent of the student's chosen field of study – such as information/data analysis and transferring knowledge to real world examples. As a result, faculty fellows decided to address these fundamental concepts in their courses.

For the remaining three semesters, faculty fellows worked and continue to work on this ASSETT supported program in their home departments. Each department selected different programs as determined by their department needs. In one program the MCDB and EBIO departments are working together to initiate a Faculty Learning Community that focuses on developing Course-based Undergraduate Research Experiences (CUREs). In another program, the ATOC department is developing teaching modules that emphasize quantitative analysis for general use across multiple courses. Additionally, the MCDB department is developing a student Journal that allows students to submit their research papers for peer review by MCDB faculty while the EBIO department is developing pedagogy training materials for undergraduate teaching assistants.

In the IPHY department, we implemented a program to develop learning goals for our lab courses and labs associated with core courses. There are two lab courses – Human Anatomy and Human Physiology plus three IPHY core courses that have labs – Biomechanics, Cell Physiology, and Exercise Physiology. With the exception of the Human Physiology Lab, none of these labs had learning goals.

We are currently in the process of developing learning goals for all our labs and we plan to share these developed learning goals with the IPHY faculty in the fall 2018 semester. These lab learning goals will help the teaching faculty to:

- 1) Understand what students need to learn in these labs
- 2) Develop specific assessment instruments to assess students' learning gain
- 3) Structure the labs to maximize learning gain
- 4) Provide cohesiveness between the labs
- 5) Visualize lab skills that may be overlapping between labs and/or need to be reinforced
- 6) Assess how the human physiology lab may affect learning gain in the other IPHY core courses that feature a lab

IPHY students will benefit from the lab learning goals as they can use these learning goals as a study tool to assess their own learning during a semester. As an example, one of the Human Physiology Lab learning goals is: "Develop a figure caption and table title that summarizes the experimental variables, comparator group/condition, methodology, sample being tested, sample size, and statistical information, as appropriate". This learning goal requires that students generate a complete figure caption and table title so that readers can identify the top-level information in the presented data prior to reading the entire lab experiment. This is an important skill as many scientists and researchers often read the figure captions and table titles first before reading a scientific journal article. This learning goal is in line with writing modern scientific journal articles where researchers often present their data with figures and tables.



The ASSETT Faculty Fellows Program has provided a spark to ignite the lab learning goals program. Future work may involve collaborations between departments. For example, the three biology departments (IPHY, MCDB, and EBIO) are all interested in training undergraduate students in the area of teaching pedagogy. Here it would be beneficial if the three biology departments could work together – sharing resources to develop teaching materials and courses.

Our department will continue to participate in the Faculty Fellows Program as it helps to foster a greater sense of community around our educational mission.

¹ASSETT: Arts and Sciences Support of Education Through Technology

Interview with IPHY BA/MS Student & 2018 Olympian Petra Hyncicova

IPHY BA/MS student Petra Hyncicova recently returned to Boulder after competing at the Winter Olympics in Pyeong Chang, South Korea. She competed in cross-country skiing representing her home country of the Czech Republic (and of course the Buffs too!). For her M.S. thesis, Petra is conducting research in Prof. Rodger Kram's Locomotion Lab. Naturally, she is studying cross country skiing. Specifically, Petra is quantifying the effects of ski pole mass on the energetic cost of skiing. In the lab, her subjects use roller skis so that they can ski on the treadmill.

Petra kindly agreed to answer a few questions for the IPHY newsletter about her Olympic experience.

IPHY: Which events did you race at the Olympics and which race are you most proud of?

PH: I raced the 15km skiathlon, the classic sprint, the 10km skate and the 30km classic. I am most proud of my finish in the 30km race, because it was my only second 30k race of my life and because we had really tough spring snow conditions for this race. It was really tough!

IPHY: What was your favorite thing to eat in the Olympic village? Did you explore the food options?

PH: In the Olympic village, we had a big dining hall with 5 different cuisines. I mostly ate the Italian and the Korean/Asian cuisine. And my favorite things to eat were kimchi (fermented vegetables), miso soup, sushi, mandu (Korean stuffed dumplings) and all kinds of pasta. Unfortunately, we did not have enough time to explore more of the Korean culture, but we went to Korean barbecue once, which was delicious. And I also tried their famous iced coffee.



*Skiing picture captured by
Michal Svacek, MAFRA*



IPHY: Were there any language barrier issues?

PH: Yes, many. All the volunteers were really nice people, who did their best to make us happy, but most of the volunteers struggle with English. So once, when the whole Czech women's cross country ski team was selected for doping control, the anti-doping volunteers came to our rooms at 6 am, turned the lights on and stared at us. We were all confused and asking what is happening and they were not able to explain that we have to go to the doping control. We were actually scared that something bad was happening in the Olympic village. But after few minutes, they showed us a document in English from the anti-doping authorities that explained what was going on.

IPHY: On TV, the start area looks like a total zoo and each athlete seems to have a different ritual leading up to the start of a race. Did you see anything memorable that other athletes did to prepare? Do you have any unusual rituals, good luck charms etc.?

PH: The start area is a total zoo! But, most of the athletes there are professionals, so they usually focus just on themselves and do different kinds of warming up and breathing exercises. But at the Olympics, you meet people from exotic countries, who take selfies with everyone and want to talk instead of warming up. Some people pray (especially before the 30km). My special ritual is to listen to music until the last minute before the start, I dance off my nervousness and usually I wear some special earrings for each race. However, at the Olympics, I received a gift of earrings with the Czech flag from one of my teammates, and so I wore the same earrings for all of my races in Pyeong Chang.

IPHY: The sprint and 30km race are almost complete opposites in terms of physiology. Was it difficult to prepare for both races at the same time or did you focus on one over the other?

PH: There was a lot of time between the sprint and the 30k, so if I would do just these two, I would have been able to manage to change my training plan and habits to prepare better for both races. However, I raced the 10km just two days after the sprint and I was supposed to race the team sprint also, so I was still more in the short distance mode until the last 3 days before the 30k. So, even though I did not have more time to prepare specifically for the 30k, I think it would not have changed my results that much. The 30km is a race based mostly on all the aerobic hours of training in the summer, fall, and beginning of winter, not just on a week and half of special preparation.

IPHY: During training or during races, do you ever think about what you have learned in your IPHY classes or do you just go on autopilot?

PH: More during training than races. I like to learn new stuff and try it on myself, but I do not like to experiment during races. In races, I go on autopilot. But at the Olympics, I used some knowledge from my Sleep Physiology class to manage the time change. I also looked over some notes from my Exercise Physiology class, but did not really change that much. After all the years of training and racing, I know my body really well and most of the time I know what to do to perform at my best.

IPHY: Were there any other athletes that you were excited to meet?

PH: Definitely. One of my sport idols and sport heroes is Marit Bjoergen, a Norwegian skier, who is now the most decorated Winter Olympian of all times (15 medals). She has been my favorite skier since I was 10 years old. Bjoergen is now 37 years old. I admire her specific style of skiing and also she is the only "bad-ass" skier with eyebrow piercings. After I met her in 2009 in person, I liked her even more, because she was so friendly, nice and funny person. So for me, just standing at the start line next to her is a big achievement and honor.

IPHY: Thanks for your time Petra and good luck next week at the NCAA championships.

PH: You're welcome, this was fun.

[Thank you to the Locomotion Lab for providing this interview with Petra.]





IPHY Shaped My Career in Research by Madeline Paton and Parsa Gharsem



Maddie: As a freshman, I had no idea what I wanted to do with my future. Biology classes had always interested me, so I decided to major in integrative physiology. I had no idea that this decision would change the trajectory of my life, and ultimately lead to my current position as a member of the 2021 class at the University of Colorado School of Medicine. After joining Dr. Fleshner's lab in late 2011, I quickly realized I had found my place at the University of Colorado-Boulder. Not only did I find my passion for science, but found a wonderful community of like-minded and driven people. Research was unlike anything I had experienced in the classroom. The freedom to let the information guide me was extremely rewarding, and ultimately motivated me to apply for the concurrent BA/MS program. With Dr. Fleshner's patience and guid-

ance, I completed my first research project and graduated in 2014. This was an invaluable experience that will assist me throughout my medical school career and career as a physician.

Parsa: Currently a 4th year medical student at the Colorado School of Medicine, I graduated in 2014 with a bachelor's degree in integrative physiology. While completing my degree I was a member of the Stress Physiology Lab where I subsequently completed an undergraduate honors thesis. While working in the Fleshner lab I not only learned the basics of how to think like a scientist but I also fell in love with learning. The men and women who I worked alongside not only became invaluable professional colleagues but some of my closest friends. I owe Dr. Fleshner a huge thank you for letting me be a part of her amazing team and being a fantastic teacher. I would not be where I am professionally had it not been for Dr. Fleshner pushing me to improve every day.

Kudos

Dr. Josiane Broussard recently received a Center for Women's Health Research Faculty Research Development Award and a pilot award from the Colorado Nutrition Obesity Research Center, both from the University of Colorado Denver, Anschutz Medical Campus.

Dr. Josiane Broussard recently accepted a tenure-track position at Colorado State University which will begin in July.

Dr. David Sherwood will speak at the Professional Golfers Association Global Youth and Family Summit on the benefits of an external focus of attention in motor performance.

Dr. David Sherwood and recent graduate Dakota Hitchcock submitted a paper to the *International Journal of Exercise*.

Dr. Teresa Foley and **Ruth Heisler** attended a six-day education specialist training at Stanford University run by Dr. Carl Wieman.



At the Human Anatomy and Physiology Society conference in Salt Lake City in May, **Dr. Janet Casagrand** and **Ruth Heisler** ran a workshop on how to develop and incorporate case studies into a course.

Dr. Christopher Lowry was recently recognized in 2016 Research Highlights: Top 10 Advancements & Break-throughs by Foundation Grantees in 2016. Brain & Behavior Research Foundation: <https://bbrfoundation.org/2016-research-highlights>

Dr. Charles Hoeffler has recently published two papers, the first in eLife describing the effects of AKT isoforms on synaptic plasticity and memory and the second in Neuroscience detailing sleep abnormalities in Down Syndrome model mice.

Marissa Ehringer is a co-author on a paper published in Biological Psychiatry demonstrating that candidate genes previously studied for schizophrenia are no more associated with the disease than non-candidate genes.

Tom LaRocca, Chris Martens and **Doug Seals** published a review article in the journal Aging Research Reviews discussing research evidence-based dietary interventions for promoting optimal cardiovascular aging. <https://www.ncbi.nlm.nih.gov/pubmed/27693830>

Drs. Janet Casagrand and **Teresa Foley** participated in the Fall 2017 *Transforming Education, Stimulating Teaching and Learning Excellence* (TRESTLE) semester-long, Scholars program: “Exploring Course Based Undergraduate Research Experiences (CUREs)” in conjunction with the Center for STEM Learning (CSL).

Dr. Robert Mazzeo launched a Coursera based Massive Open Online Course (MOOC) entitled the *Science of Exercise*. With over 50,000 visitors already, as stated in the CU Alumni magazine the *Coloradan*, this course is: “on track to be the most popular course in the history of CU.” The course found at: <https://www.coursera.org/learn/science-exercise>.

Dr. Matt McQueen will serve as the Director for the NCAA/Pac-12 funded Concussion Coordinating Unit.

Heidi Bustamante received an ASSETT grant and will join the Faculty Fellowship Program starting spring 2018 and continuing through spring 2019.

In August, more than 50 of **Dr. Rodger Kram’s** colleagues, former grad students and post-docs celebrated his career accomplishments and semi-retirement with a scientific conference at CU’s Mountain Research Station. The “Kramference” participants also roasted Dr. Kram by re-telling embarrassing stories.

Dr. Rodger Kram and his lab recently published two papers in the journal *Sports Medicine*. The first quantified how a slightly downhill course or a modest tailwind could facilitate the first sub-2 hour marathon, The second paper detailed measurements of a new marathon racing shoe which requires 4% less energy. Further, Nike named the racing shoe based on the scientific result. Both studies received much attention in the popular media (Wired magazine, Outside magazine etc.).

Annie Miller, in Dr. Pei-San Tsai’s lab, has recently won the graduate student poster award at the 2018 Front Range Neuroscience Meeting for her presentation on the neural plasticity of the reproductive brain in response to novel environmental cues.



A Cartoon Representation of Dr. Monique LeBourgeois' Research by Leif Saul

SHEDDING LIGHT ON THE DEVELOPMENT OF CHILDHOOD SLEEP PROBLEMS

SLEEP IN CHILDREN IS SERIOUS BUSINESS...

...BOTH FOR THE DISRUPTION TO FAMILIES THAT CHILDHOOD SLEEP DIFFICULTIES CAN CAUSE...

...AND FOR THE RISK THEY POSE OF DEVELOPING INTO CHRONIC SLEEP DISORDERS, WHICH ARE KNOWN TO INCREASE THE RISK OF CHRONIC DISEASES.

SOME OF THE FIRST BASIC RESEARCH ON SLEEP AND CIRCADIAN PHYSIOLOGY IN YOUNG CHILDREN IS BEING CARRIED OUT BY MONIQUE LEBOURGEOIS AND COLLEAGUES.*

HEART DISEASE
DIABETES
ANXIETY
DEPRESSION

***SLEEP AND DEVELOPMENT LABORATORY, DEPT. OF INTEGRATIVE PHYSIOLOGY, UNIVERSITY OF COLORADO BOULDER**

DR. LEBOURGEOIS

IT'S WELL KNOWN THAT EVENING LIGHT EXPOSURE SUPPRESSES THE SLEEP-PROMOTING HORMONE, MELATONIN, IN ADULTS...

OH -- THANKS FOR THE REMINDER!

I'LL TURN DOWN THE LIGHTS

DR. AKACEM

BUT NOBODY KNEW TO WHAT DEGREE THIS WAS TRUE FOR YOUNG CHILDREN -- SO MY STUDENT LAMEESE AKACEM AND I DECIDED TO "SHED LIGHT" ON THIS!

THE KEY WAS TO USE "TODDLER-FRIENDLY" RESEARCH METHODS.

TO ESTABLISH A BASELINE, CHILDREN HAD TO BE SHIELDED FROM LIGHT EXPOSURE --

-- SO WE COVERED THE WINDOWS AND DIMMED THE LIGHTS -- WE CALLED THIS "CAVE DAY."

WE MONITORED MELATONIN LEVELS BY TAKING SALIVA SAMPLES

-- WHICH WE OBTAINED BY HAVING THE KIDS CHEW ON COTTON WADS.

THE NEXT NIGHT, WE MEASURED MELATONIN AGAIN WHILE EXPOSING THEM TO AN HOUR OF BRIGHT LIGHT

-- USING A LIGHTED PLAY TABLE WITH TRANSPARENT TOYS TO LET THE LIGHT THROUGH.

GRAD STUDENTS CALLED THEMSELVES "SLEEP FAIRIES"

CHEW LIKE A TIGER!

OUR RESULTS SHOWED THE KIDS' MELATONIN SECRETION WAS GREATLY REDUCED BY EVENING LIGHT EXPOSURE.

PHYSIOLOGICAL STUDIES OF CHILDREN'S EYES HAVE SHOWN THAT THEY ARE MORE SENSITIVE THAN ADULTS' TO EVENING LIGHT BEFORE BEDTIME.

SO OUR FUTURE WORK WILL DETERMINE EXACTLY HOW MUCH LIGHT IS NEEDED TO SHIFT THE CIRCADIAN CLOCK...

WHICH WILL BE AN IMPORTANT KEY TO HELPING PARENTS WITH THEIR KID'S SLEEP.

CAVE DAY

NEXT DAY BRIGHT LIGHT EXPOSURE

MELATONIN

HOURS RELATIVE TO BEDTIME

BEEP!
BLOOP!

I LOVE THIS SLEEPING KID!

Leif Saul



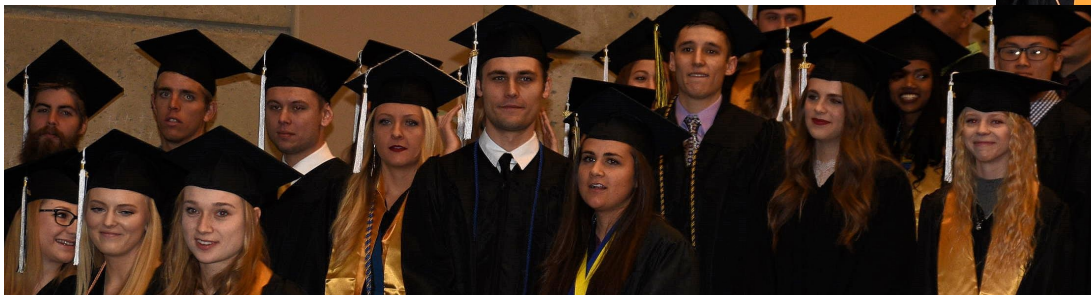
Fall 2017 Bachelor of Arts

Dustin Beamon	William Hoth	Emily Owens
Emily Bernhardt	Dean Hoth	Monica Patten
Brian Blanchard	Madison Hunt-Snyder	Ryan Phibbs
Zoe Bruce	Megan Hutchison	Carlene Pfenning
Darya Cogswell	Kenny Huynh	Justin Phu
Kelsey Connolly	Julian Johnson	Claire Ramer
Safiya Dawlatzai	Michael Kain	Zachary Reinholtz
Remington Divine	Makenzie Kline	Jordan Reiss
Noelle Doyle	Brent Knud-Hansen	Abigail Rigsby
Madison Duvall	Ryan LaGreca	Aaron Rodarte-Trujillo
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Fall 2017 Master of Science

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To learn about the many ways in which to make a donation, contact:
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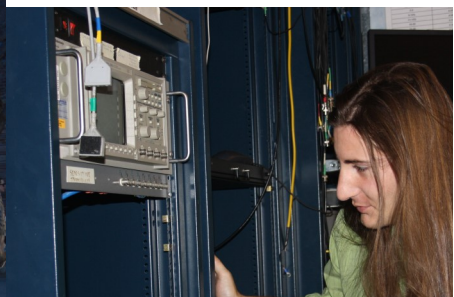
Major Profession _____

Recent Degree(s) From Other School(s)/Date(s) _____

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