Summer 2018

CrossSections, Summer 2018

University of Northern Iowa. Department of Physics.

Copyright ©2018 Department of Physics, University of Northern Iowa
Follow this and additional works at: https://scholarworks.uni.edu/phynews
Part of the Higher Education Commons, and the Physics Commons

Let us know how access to this document benefits you

Recommended Citation
https://scholarworks.uni.edu/phynews/4

This Newsletter is brought to you for free and open access by the Department of Physics at UNI ScholarWorks. It has been accepted for inclusion in CrossSections by an authorized administrator of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.
It is a pleasure to be able to report on happenings in the Physics Department as well as across UNI for the 2018 edition of Cross Sections. I’ll start with the wider view at the university level.

During the 2017-18 academic year, there were many events that were of significant importance to the entire UNI community. I’ll mention a few of them here. First, the university has started its preparations for the decennial reaccreditation process. The accrediting body is the Higher Learning Commission (HLC). A Steering Committee has been formed, along with several subcommittees that will be responsible for various aspects of the accreditation process. A major focus will be assessment of student learning, which was identified as an area needing improvement in the last reaccreditation process. The emphasis on assessment has led the Physics Department (and other academic departments) to completely revamp program assessment procedures, which I believe will lead to better student outcomes.

The provost has undertaken a multiyear process to reform the General Education program (currently called the Liberal Arts Core or LAC). A committee has been formed to direct and coordinate the process of revising the program. Ultimately, the new program will consist of 36 credit hours of coursework, substantially shorter than the current 45 credit hours. Undoubtedly, students will cheer but some departments that have heavy teaching commitments in the LAC are expressing concern.

A faculty evaluation committee has also been constituted and charged by the provost to develop a comprehensive evaluation process for faculty across the university. The main elements are: (i) the definition of faculty workload (the weighting of teaching, research, and service and what contributes to each category) and (ii) university-wide evaluation procedures for annual review, tenure, promotion and post-tenure review. Yours truly is a member of this committee and I can tell you that it has not been a walk in the park on a warm summer day. The committee has held several forums to elicit feedback from faculty and we learned, among other things, that some people have strong feelings about some of the proposed changes. However, progress is being made and the committee expects to complete its work by the end of the fall 2018 semester.

On the departmental front, I will begin with the departure of faculty member Rui He, who was an associate professor of physics. Rui resigned her position at UNI last August and took a position as associate professor of electrical engineering at Texas Tech University. Rui was an exceptionally productive physics faculty member. As you might recall, she was the first faculty member in UNI’s history to have been awarded a prestigious CAREER grant by the National Science Foundation. We wish Rui well in her new position.

One of our majors, Joseph Tibbs, made us proud by earning an Honorable Mention in the highly competitive national Goldwater Scholarship competition. This is an especially noteworthy achievement given that Joseph is just a sophomore. This summer, Joseph will be participating in a Research Experiences for Undergraduates (REU) program at Yale University, where he will likely be conducting research in the area of computational biophysics. Over the past 6 years, two previous physics majors, Corey Cooling and Lucas Beving, have participated in summer research programs at Ivy-League universities (Columbia and Princeton, respectively).

In the area of curriculum, we are moving forward with a new data science emphasis in our B.A. degree program. Data science is a burgeoning field that includes big data, data
You will also be interested to learn that the Physics Club has completely rewritten its bylaws and has undertaken a top-to-bottom reinvigoration program. The Club has already bought a “new” sofa for the Physics Majors’ room. The sofa was generously sponsored by alumnus Kevin Junck, whom you will read more about in this issue.

I’ll end this message on a note of gratitude. You, our loyal alumni and friends, have been very generous to the Physics Department over the past year. Your gifts continue to support undergraduate research fellowships and scholarships for our students. Thank you for your kind support and I hope you will continue to invest in our students.

As always, please stop by the Physics Department for a visit if you are in the area. In fact, you have the perfect reason for a visit—our annual Homecoming Picnic on October 20, 2018. I hope to see you there!

Dr. Paul Shand
Professor and Head of the UNI Department of Physics
You will also be interested to learn that under the leadership of new co-presidents Taylor Harris and Joseph Tibbs, the Physics Club has completely rewritten its bylaws and have undertaken a top-to-bottom reinvigoration program. The Club has already bought a “new” sofa for the Physics Majors’ room. The sofa was generously sponsored by alumnus Kevin Junck, whom you will read more about in this issue.

I’ll end this message on a note of gratitude. You, our loyal alumni and friends, have been very generous to the Physics Department over the past year. Your gifts continue to support undergraduate research fellowships and scholarships for our students. Thank you for your kind support and I hope you will continue to invest in our students. As always, please stop by the Physics Department for a visit if you are in the area. In fact, you have the perfect reason for a visit – our annual Homecoming Picnic on October 20, 2018. I hope to see you there!

Dr. Paul Shand
Professor and Head of the UNI Department of Physics
Homecoming

The 2018 Homecoming Picnic was, for the first time, held indoors because of inclement weather. Attendees gathered in Room 114, the main lecture room in Begeman Hall, which seats 88. Despite the weather, there was a good turnout. It was also a much easier trip for students already in the Physics Building doing homework!

Though it was wet outside, conversation certainly was not dampened!

In the foreground, 2015 Physics graduate Corbyn Mellinger (left) and current physics major Byron Fritch chat more freely, having eaten every morsel on their plates.

Department head Paul Shand presents alumnus Jack Dostal ('96) with a “Superalumnus” award. Over the years, Jack has been a fixture at Homecoming events and a regular visitor to the Physics Department. Jack teaches at Wake Forest University.

Begeman Lecture

The 2018 Begeman Lecture was held on March 28 at the Lang Hall Auditorium. The lecture was given by Dr. Charles Falco of the University of Arizona. The title of the lecture was “The Science of Optics: The History of Art.” It was a fascinating look at how Falco and collaborators used optical physics to uncover some of the techniques used by some of the masters to create their paintings. The annual Begeman Lecture is sponsored by Richard Jourdan and Frances Jourdan.

Dr. Charles Falco explains his work at the 2018 Begeman Lecture.

Some of the artwork investigated by Falco.

Physics Banquet

The annual Physics Awards Banquet was held in the Slife Ballroom in the Commons Building on April 13. It is always gratifying to reward students for excellence in academics and service to the department, and have a great meal in the process.

Physics Teaching major Taylor Harris receives one of her two awards from Dr. Larry Escalada.

Summer Research Fellowship awardees (standing) are deservedly applauded by the attendees. Bravo!
Homecoming

The 2018 Homecoming Picnic was, for the first time, held indoors because of inclement weather. Attendees gathered in Room 114, the main lecture room in Begeman Hall, which seats 88. Despite the weather, there was a good turnout. It was also a much easier trip for students already in the Physics Building doing homework!

In the foreground, 2015 Physics graduate Corryn Mellinger (left) and current physics major Byron Fritch chat more freely, having eaten every morsel on their plates.

Begeman Lecture

The 2018 Begeman Lecture was held on March 28 at the Lang Hall Auditorium. The lecture was given by Dr. Charles Falco of the University of Arizona. The title of the lecture was “The Science of Optics; The History of Art.” It was a fascinating look at how Falco and collaborators used optical physics to uncover some of the techniques used by some of the masters to create their paintings. The annual Begeman Lecture is sponsored by Richard Jourdan and Frances Jourdan.

Begeman Lecture

Some of the artwork investigated by Falco.

Physics Banquet

The annual Physics Awards Banquet was held in the Slife Ballroom in the Commons Building on April 13. It is always gratifying to reward students for excellence in academics and service to the department, and have a great meal in the process.

Physics Teaching major Taylor Harris receives one of her two awards from Dr. Larry Escalada.

Summer Research Fellowship awardees (standing) are deservedly applauded by the attendees. Bravo!
Physics faculty member Andy Stollenwerk creates a cloud…

…and when the cloud dissipates, Andy has gotten much younger! (The younger version of Andy bears a striking resemblance to his son, Quincy.)

Physics Competition

The Physics Department continues to organize and coordinate both the regional and state-level Physics Competitions for high-school students. The students compete in 5 events: the soda-straw arm, the mousetrap car, the catapult, the toothpick bridge, and the challenge problem. The challenge problem involves measuring a given quantity (e.g., the mass of an object) using the seemingly random pieces of equipment provided.

Farewell to Rui He

Physics faculty member Rui He left us last August to take a position as associate professor of electrical engineering at Texas Tech University. At Texas Tech, Rui will have the opportunity to work with Ph.D. students, which will certainly boost her research career. Also, the warmer weather probably will not hurt.

Holiday Colloquium

The Holiday Colloquium is a special event held at the end of each fall semester. With gifts appropriate to the season, the faculty expresses its gratitude to the staff members of the department for their excellent work throughout the year. The Holiday Colloquium also features performances of demonstrations, “magic” tricks and minor miracles by faculty, staff and students. It is an excellent way to end the year!

Presentations by Visitors


“Everyday Astronaut” Tim Dodd talks about his work educating the public about science. Tim has his own astronaut suit, which you can see on the screen. In addition to on-site presentations, Tim has a Youtube channel (“Everyday Astronaut”) that discusses science, especially space and space-related technology.

Students get ready to launch a ping pong ball so that it travels certain horizontal distances.

Student operates the bridge tester, which applies an increasing force to the deck of the bridge until it fails.

Rui He shows off her farewell gift from the Physics Department.
Holiday Colloquium

The Holiday Colloquium is a special event held at the end of each fall semester. With gifts appropriate to the season, the faculty expresses its gratitude to the staff members of the department for their excellent work throughout the year. The Holiday Colloquium also features performances of demonstrations, “magic” tricks and minor miracles by faculty, staff and students. It is an excellent way to end the year!

Presentations by Visitors

Physics faculty member Andy Stollenwerk creates a cloud…

…and when the cloud dissipates, Andy has gotten much younger! (The younger version of Andy bears a striking resemblance to his son, Quincy.)


“Everyday Astronaut” Tim Dodd talks about his work educating the public about science. Tim has his own astronaut suit, which you can see on the screen. In addition to on-site presentations, Tim has a Youtube channel (“Everyday Astronaut”) that discusses science, especially space and space-related technology.

Physics Competition

The Physics Department continues to organize and coordinate both the regional and state-level Physics Competitions for high-school students. The students compete in 5 events: The soda-straw arm, the mousetrap car, the catapult, the toothpick bridge, and the challenge problem. The challenge problem involves measuring a given quantity (e.g., the mass of an object) using the seemingly random pieces of equipment provided.

Student operates the bridge tester, which applies an increasing force to the deck of the bridge until it fails.

Farewell to Rui He

Physics faculty member Rui He left us last August to take a position as associate professor of electrical engineering at Texas Tech University. At Texas Tech, Rui will have the opportunity to work with Ph.D. students, which will certainly boost her research career. Also, the warmer weather probably will not hurt.

Rui He shows off her farewell gift from the Physics Department.
BYRON FRITCH

One of Byron Fritch’s (Dike, IA) deciding factors in choosing to attend UNI was the size of the university. For him, it has the perfect balance between having the features and activities of bigger schools, like the Gallagher Bluedorn Performing Arts Center and Division I athletics, but at the same time maintaining a good ratio of students to professors, so there was the opportunity to develop personal relationships. “I knew that I would not like attending a large institution because I would have felt like a number in a crowd of students. UNI offered the large campus activities but also the ability to connect one-on-one with the professors,” said Fritch.

Fritch decided to major in physics due to his interest in mathematics and his desire to learn how things work. In combining those two things, physics provides an opportunity to use math techniques to predict how objects and systems will behave. Fritch says he enjoys discovering explanations for everyday occurrences that the general population might overlook.

As part of that exploration into the way things function, Fritch cites the opportunity for undergraduate research as one of his favorite parts of the Physics department. Undergraduates are given the opportunity to conduct and run the experiments, providing great experience and the chance to develop laboratory skills needed for future endeavors. One of the projects Fritch worked on was research on nanocellulose aerogels. Nanocellulose aerogels are created by using an ultrasonic probe to send high frequency sound waves through cellulose, breaking them into particles roughly 1,000 times smaller than the diameter of a human hair. These particles are then freeze-dried to create an aerogel derived from plant material, meaning it is safe for humans to touch. Aerogels are good thermal insulators and serve as catalysts in chemical reactions.

Fritch graduated in May and plans to attend graduate school at Colorado State University, where he will pursue a PhD in Experimental Physics. Upon completing those studies, Fritch isn’t entirely sure on his next steps, although they may involve a few years of research at a government lab, helping with outreach events and possibly spreading his passion for physics to others by becoming a professor at a small university.

Physics major Xiaoxiao Liu discusses Raman spectroscopy measurements on the layered crystalline material HgCoSe.

When not in the classroom or the laboratory, Fritch kept busy with involvement in various clubs and organizations like the Student Admissions Ambassadors, UNI Physics Club and the Honors Student Advisory Board. He credits these organizations with helping him discover that college experience a positive one. “Through these groups, I met students from different majors across campus who have been able to help me out in a number of ways during my college career. Being a successful student also requires that you put some time into an activity other than your studies so you can learn about yourself outside of the classroom,” Fritch said.

In his free time, Fritch likes to run on the trails in the Cedar Valley, discovering peace and quiet in spots inaccessible to cars. When the weather isn’t cooperating, he likes to hang out with his friends and play card and board games.

Fritch graduated in May and plans to attend graduate school at Colorado State University, where he will pursue a PhD in Experimental Physics. Upon completing those studies, Fritch isn’t entirely sure on his next steps, although they may involve a few years of research at a government lab, helping with outreach events and possibly spreading his passion for physics to others by becoming a professor at a small university.

Physics major Jake Parks explains his research on the magnetic properties of TaS, intercalated with Mn.

Physics Scholarships and Awards

Louis Begeman Memorial Scholarships
Trevor Dunt
Joseph Tibbs

Grossman-Perrine Scholarship
Taylor Harris

Begeman Fund for Excellence in Physics Scholarship
Evon O’Leary

C. Clifton Chancey Scholarship in Physics
Dexter Cox

Jourdan Mentor Scholarship
Mason Clendenen

STUDENT PROFILE

STUDENT RESEARCH

Louis Begeman Memorial Scholarships
Trevor Dunt
Joseph Tibbs

Grossman-Perrine Scholarship
Taylor Harris

Begeman Fund for Excellence in Physics Scholarship
Evon O’Leary

C. Clifton Chancey Scholarship in Physics
Dexter Cox

Jourdan Mentor Scholarship
Mason Clendenen

Physics Summer Undergraduate Research Fellowships

Brent Anderson
Sam Prophet
Wayne Bowie
Nathan Schmidt

Outstanding Performance in Introductory Physics
Zach Heinzman
Noah Haack

First Year Projects in Physics Awards
Noah Haack
Taylor Harris
Zach Heinzman
Xiaoxiao Liu

Outstanding Research Presentation
Joseph Tibbs

Physics Department Service Award
Byron Fritch
Jake Parks

Outstanding Performance in Introductory Physics
Zach Heinzman
Noah Haack

First Year Projects in Physics Awards
Noah Haack
Taylor Harris
Zach Heinzman
Xiaoxiao Liu

Outstanding Research Presentation
Joseph Tibbs

Physics Department Service Award
Byron Fritch
Jake Parks

Brent Anderson
Sam Prophet
Wayne Bowie
Nathan Schmidt

Outstanding Performance in Introductory Physics
Zach Heinzman
Noah Haack

First Year Projects in Physics Awards
Noah Haack
Taylor Harris
Zach Heinzman
Xiaoxiao Liu

Outstanding Research Presentation
Joseph Tibbs

Physics Department Service Award
Byron Fritch
Jake Parks

Brent Anderson
Sam Prophet
Wayne Bowie
Nathan Schmidt
Physics major Xiaoxiao Liu discusses Raman spectroscopy measurements on the layered crystalline material HgCr$_2$Se$_4$.

Physics major Jake Parks explains his research on the magnetic properties of TaS$_2$ intercalated with Mn.

BYRON FRITCH

One of Byron Fritch’s (Dike, IA) deciding factors in choosing to attend UNI was the size of the university. For him, it has the perfect balance between having the features and activities of bigger schools, like the Gallagher Bluedorn Performing Arts Center and Division I athletics, but at the same time maintaining a good ratio of students to professors, so there was the opportunity to develop personal relationships. “I knew that I would not like attending a large institution because I would have felt like a number in a crowd of students. UNI offered the large campus activities but also the ability to connect one-on-one with the professors,” said Fritch.

Fritch decided to major in physics due to his interest in mathematics and his desire to learn how things work. In combining those two things, physics provides an opportunity to use math techniques to predict how objects and systems will behave. Fritch says he enjoys discovering explanations for everyday occurrences that the general population might overlook.

As part of that exploration into the way things function, Fritch cites the opportunity for undergraduate research as one of his favorite parts of the Physics department. Undergraduates are given the opportunity to conduct and run the experiments, providing great experience and the chance to develop laboratory skills needed for future endeavors. One of the projects Fritch worked on was research on nanocellulose aerogels. Nanocellulose aerogels are created by using an ultrasonic probe to send high frequency sound waves through cellulose, breaking them into particles roughly 1,000 times smaller than the diameter of a human hair. These particles are then freeze-dried to create an aerogel derived from plant material, meaning it is safe for humans to touch. Aerogels are good thermal insulators and serve as catalysts in chemical reactions.

Fritch graduated in May and plans to attend graduate school at Colorado State University, where he will pursue a PhD in Experimental Physics. Upon completing those studies, Fritch isn’t entirely sure on his next steps, although they may involve a few years of research at a government lab, helping with outreach events and possibly spreading his passion for physics to others by becoming a professor at a small university.

Research continues to be vigorously pursued by our majors. In some cases, students who are not physics majors have been involved in research with physics faculty members. The students present their results at departmental colloquia, on-campus research conferences, and with sufficient funding, national conferences.

STUDENT RESEARCH

Physics Scholarships and Awards

Louis Begeman Memorial Scholarships
Trevor Dunt
Joseph Tibbs

Grossman-Perrine Scholarship
Taylor Harris

Begeman Fund for Excellence in Physics Scholarship
Evan O’Leary

C. Clifton Chancey Scholarship in Physics
Dexter Cox

Jourdan Mentor Scholarship
Mason Clendenen

STUDENT PROFILE

Brent Anderson
Sam Prophet
Wayne Bowie
Nathan Schmidt

Dexter Cox
Paul White
Evan O’Leary

Outstanding Performance in Introductory Physics
Zach Heinzman
Noah Haack

First Year Projects in Physics Awards
Noah Haack
Taylor Harris
Zach Heinzman
Xiaoxiao Liu

Outstanding Research Presentation
Joseph Tibbs

Physics Department Service Award
Byron Fritch
Jake Parks

Physics Summer Undergraduate Research Fellowships

Zach Heinzman
Noah Haack
Xiaoxiao Liu

Outstanding Performance in Introductory Physics
Zach Heinzman
Noah Haack

First Year Projects in Physics Awards
Noah Haack
Taylor Harris
Zach Heinzman
Xiaoxiao Liu

Outstanding Research Presentation
Joseph Tibbs

Physics Department Service Award
Byron Fritch
Jake Parks

Outstanding Performance in Introductory Physics
Zach Heinzman
Noah Haack
Implementing New Standards for High School Science

Three years ago, Iowa adopted a new set of science teaching standards that promise to increase exposure to physics concepts and engineering practices for all K-12 students in the state. While it is too early in the process to determine whether or not this will have an impact on enrollments in engineering and physics programs, including those within our department, the transition is currently challenging physics teachers statewide to rethink how they present concepts and measure proficiency.

Iowa adopted a slightly modified version of the Next Generation Science Standards (NGSS). Twenty-six states, including Iowa, continue to roll out the standards, and Iowa was the 15th state to officially adopt them. By 2020, the NGSS will replace the current Iowa Core science standards.

While the NGSS include disciplinary core ideas within the domains of physical, life, and earth and space science that are in some ways similar to previous standards, they differ from previous documents in their inclusion of science and engineering practices and cross-cutting concepts that build connections between multiple areas of science. Many standards include performance expectations that all students are expected to meet, creating a challenge for science educators statewide as they grapple with how best to deliver content, some of it new, and assess student learning. We reached out to some recent graduates of the department’s physics teaching program and asked how their districts are handling the transition.

Kirsten Olson (B.A. Physics Teaching, 2017) teaches physics and chemistry courses at Cedar Falls High School. She reports that Cedar Falls is in the midst of their three-year implementation plan. NGSS standards for grades 6-8 debuted this year, ninth grade students will take a new course of earth science and some introductory chemistry and physics next year, and the following year all high school courses fulfill the NGSS. Tenth grade students will take a year long biology course, while 11th grade students will take semester-long courses in chemistry and physics that address the majority of the physical science standards. Students with specific interest in science may opt for year-long chemistry and physics courses if they prefer.

Iowa’s Science Standards also promise to increase exposure to physics concepts and engineering practices for all K-12 students in the state. While it is too early in the process to determine whether or not this will have an impact on enrollments in engineering and physics programs, including those within our department, the transition is currently challenging physics teachers statewide to rethink how they present concepts and measure proficiency.

Iowa adopted a slightly modified version of the Next Generation Science Standards (NGSS). Twenty-six states, including Iowa, continue to roll out the standards, and Iowa was the 15th state to officially adopt them. By 2020, the NGSS will replace the current Iowa Core science standards.

While the NGSS include disciplinary core ideas within the domains of physical, life, and earth and space science that are in some ways similar to previous standards, they differ from previous documents in their inclusion of science and engineering practices and cross-cutting concepts that build connections between multiple areas of science. Many standards include performance expectations that all students are expected to meet, creating a challenge for science educators statewide as they grapple with how best to deliver content, some of it new, and assess student learning. We reached out to some recent graduates of the department’s physics teaching program and asked how their districts are handling the transition.

Kirsten Olson (B.A. Physics Teaching, 2017) teaches physics and chemistry courses at Cedar Falls High School. She reports that Cedar Falls is in the midst of their three-year implementation plan. NGSS standards for grades 6-8 debuted this year, ninth grade students will take a new course of earth science and some introductory chemistry and physics next year, and the following year all high school courses fulfill the NGSS. Tenth grade students will take a year long biology course, while 11th grade students will take semester-long courses in chemistry and physics that address the majority of the physical science standards. Students with specific interest in science may opt for year-long chemistry and physics courses if they prefer.
Implementing New Standards for High School Science

Three years ago, Iowa adopted a new set of science teaching standards that promise to increase exposure to physics concepts and engineering practices for all K-12 students in the state. While it is too early in the process to determine whether or not this will have an impact on enrollments in engineering and physics programs, including those within our department, the transition is currently challenging physics teachers statewide to rethink how they present concepts and measure proficiency.

Iowa adopted a slightly modified version of the Next Generation Science Standards (NGSS). Twenty-six states, including Iowa, currently utilize the standards, and Iowa was the 15th state to officially adopt them. By 2020, the NGSS will replace the current Iowa Core science standards.

While the NGSS include disciplinary core ideas within the domains of physical, life, and earth and space science that are in some ways similar to previous standards, they differ from previous documents in their inclusion of science and engineering practices and cross-cutting concepts that build connections between multiple areas of science. Many standards include performance expectations that all students are expected to meet, creating a challenge for science educators statewide as they grapple with how best to deliver content, some of it new, and assess student learning. We reached out to some recent graduates of the department's physics teaching program and asked how their districts are handling the transition.

Kristen Olson (B.A. Physics Teaching, 2017) teaches physics and chemistry courses at Cedar Falls High School. She reports that Cedar Falls is in the midst of their three-year implementation plan. NGSS standards for grades 6-8 debuted this year, ninth grade students will take a new course of earth science and some introductory chemistry and physics next year, and the following year all high school courses fulfill the NGSS. Tenth grade students will take a year long biology course, while 11th grade students will take semester-long courses in chemistry and physics that address the majority of the physical science standards. Students with specific interest in science may opt for year-long chemistry and physics courses if they prefer.

Other schools are removing barriers between traditional disciplines and rolling out new integrated science courses. Eric Clausen (B.A. Physics Teaching, 2014) joined the faculty at Fairfield High School in the second year of a three-year implementation plan that will culminate in Fairfield offering Integrated Science 1, 2, and 3 to all students. Though he taught Chemistry 1 this past year under the current Iowa Core, he will teach Integrated Science 1 in future years, a course for ninth grade students with an emphasis on physical science standards. Fairfield students with interest in science will still have the option of taking an elective Advanced Physics course.
In the fall semester of 1999, Charles City resident Cody Wilson came to UNI intending to major in physics teaching. But things did not quite work out that way. "I originally wanted to teach high school physics and UNI’s reputation for educating teachers was attractive," Wilson says. "As I took more classes, I decided that a B.S. in physics was the direction I wanted to go." However, this path was not an easy one for Wilson. "When I began studying physics, I was hopelessly unprepared," he states matter-of-factly. "A lot is made of the smaller size of UNI and the commitment to teaching, but in my case, it was truly the difference between making it or not." These distinctive attributes of the university were the keys to Wilson’s success. He proudly graduated with a B.S. degree in physics in 2002.

Asked to recount some of his experiences on the way to his bachelor’s degree, Wilson recalled that the Modern Physics course he took with Dr. Shand was his favorite course. "It was a course that introduced many surprising ideas about the way the universe works," Wilson enthuses. Wilson also has pleasant recollections of time spent in the student room on the second floor of the Physics Building (now on the first floor of the renovated Begeman Hall). "I fondly remember the student room. We shaped it into a room where 5–10 people could study at the same time and had many ping-pong and dart games," Wilson recollects. "I believe Professor Shand finished my years undefeated in ping-pong."

After graduating from UNI, Wilson attended the University of Massachusetts at Lowell where he was admitted into the Ph.D. program in physics. "By the time I left UNI, I felt I wanted to pursue physics as far as possible," he says. Wilson eventually opted to seek employment in industry after receiving a master’s degree. He is currently the director of research and development at Passport Systems, Inc. in the greater Boston area. In this position, Wilson manages and directs the accountability to report for learning that I have used ever since.”

Wilson asserts that his UNI education has contributed significantly to his success. "The process of learning that I experienced at UNI is really what made me succeed as a professional,” he declares. “I learned at UNI to never be afraid to ask questions about the things I don’t know. It formed the foundation for learning that I have used ever since.” When asked what advice he has for current students as they prepare to seek employment, Wilson responded readily. "Seek experience in collaborative research,” he avers. “Much of research and studying in academic environments focuses on individual work. However, the experiences gained in working in teams and the accountability to report and justify the direction you choose is extremely valuable for an industrial physicist.”

When not working on better methods to scan shipping containers, Wilson likes to travel and enjoys the outdoors. "I dedicate time each year to some outdoor adventure,” he reports. “I enjoy open water and I have run three marathons in the last four years. Wilson’s first son was born last November. Undoubtedly, he has started a marathon of another kind.
In the fall semester of 1999, Charles City resident Cody Wilson came to UNI intending to major in physics teaching. But things did not quite work out that way. “I originally wanted to teach high school physics and UNI’s reputation for educating teachers was attractive,” Wilson says. “As I took more classes, I decided that a B.S. in physics was the direction I wanted to go.” However, this path was not an easy one for Wilson. “When I began studying physics, I was hopelessly unprepared,” he states matter-of-factly. “A lot is made of the smaller size of UNI and the commitment to teaching, but in my case, it was truly the difference between making it or not.” These distinctive attributes of the university were the keys to Wilson’s success. He proudly graduated with a B.S. degree in physics in 2002.

Asked to recount some of his experiences on the way to his bachelor’s degree, Wilson recalled that the Modern Physics course he took with Dr. Shand was his favorite course. “It was a course that introduced many surprising ideas about the way the universe works,” Wilson enthuses. Wilson also has pleasant recollections of time spent in the student room on the second floor of the Physics Building (now on the first floor of the renovated Beggeman Hall). “I fondly remember the student room. We shaped it into a room where 5–10 people could study at the same time and had many ping-pong and dart games,” Wilson recalls. “I believe Professor Shand finished my years undefeated in ping-pong.”

After graduating from UNI, Wilson attended the University of Massachusetts at Lowell where he was admitted into the Ph.D. program in physics. “By the time I left UNI, I felt I wanted to pursue physics as far as possible,” he says. Wilson eventually opted to seek employment in industry after receiving a master’s degree. He is currently the director of research and development at Passport Systems, Inc. in the greater Boston area. In this position, Wilson manages and directs a multidisciplinary team of 15 members consisting of scientists, algorithm development engineers, embedded software engineers, mechanical engineers, electrical engineers, and technicians. Wilson is also responsible for discovery and exploitation of new radiation signatures for the non-intrusive inspection of fully loaded shipping containers.

Wilson asserts that his UNI education has contributed significantly to his success. “The process of learning that I experienced at UNI is really what made me succeed as a professional,” he declares. “I learned at UNI to never be afraid to ask questions about the things I don’t know. It formed the foundation for learning that I have used ever since.” When asked what advice he has for current students as they prepare to seek employment, Wilson responded readily. “Seek experience in collaborative research,” he avers. “Much of research and studying in academic environments focuses on individual work. However, the experiences gained in working in teams and the accountability to report and justify the direction you choose is extremely valuable for an industrial physicist.”

When not working on better methods to scan shipping containers, Wilson likes to travel and enjoy the outdoors. “I dedicate time each year to some outdoor adventure,” he reports. “I enjoy open water and I have run three marathons in the last four years. Wilson’s first son was born last November. Undoubtedly, he has started a marathon of another kind.
Kevin Junck

The 2018 Alumni in Residence for the Physics Department is Dr. Kevin Junck. On April 12, Kevin was “in residence” in Begeman Hall, where he met with students, faculty members and staff. He also toured the campus, which had changed somewhat since his last visit. Baker Hall, for example, had disappeared, replaced by a parking lot (or what? kinetic energy?). Kevin also gave a talk entitled “An Introduction to Physics in Medicine,” which captivated all the attendees. Finally, Kevin advised the physics students that they needed a more comfortable couch for the Physics Majors’ Room since he could never have napped on the current one. Since it is important for physics majors to have their naps, Kevin generously donated funds for the acquisition of a more comfortable couch. We are happy to report that the students have acquired a couch and have moved it into place. Let’s see if that the students have acquired a couch (please check it) and each one of them “forces” a nap on the current one. Since it is important for physics majors to have their naps, Kevin generously donated funds for the acquisition of a more comfortable couch. We are happy to report that the students have acquired a couch and have moved it into place. Let’s see if that the students have acquired a couch (please check it) and each one of them “forces” a nap on the current one.

Matt Boucher

Matthew Boucher (born in Des Moines, IA) graduated from the University of Northern Iowa (B.A in Physics and Music) in 2004. His undergraduate research with Emeritus Prof. Roger Hanson focused on string vibrations. After receiving a Masters in Music at Indiana University (Bloomington, IN), he worked as a musical instrument craftman at S.E. Shires, Co. (Hopedale, MA), where he created custom design solutions and played a leading role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his role in the...
Kevin Junck

The 2018 Alumni in Residence for the Physics Department is Dr. Kevin Junck. On April 12, Kevin was “in residence” in Begeman Hall, where he met with students, faculty members and staff. He also toured the campus, which had changed somewhat since his last visit. Baker Hall, for example, had disappeared, replaced by a parking lot (what else?). Kevin also gave a talk entitled “An Introduction to Physics in Medicine,” which captivated all the attendees. Finally, Kevin advised the physics students that they needed a more comfortable coach for the Physics Majors’ Room since he could never have napped on the current one. Since it is important for physics majors to have their naps, Kevin generously donated funds for the acquisition of a more comfortable coach. We are happy to report that the students have acquired a coach and have moved it into place. Let’s see if the nap frequency increases.

Dr. Kevin Junck graduated from UNI in 1986 with a double major in physics and mathematics and a minor in computer science. He earned an MS in physics and a Ph.D. in nuclear engineering from the University of Michigan. To the envy of most of us, Kevin held a postdoctoral research position at Fermilab, after which he went down a different path – a postdoctoral fellowship in radiology at the University of Alabama at Birmingham (UAB) hospital. Kevin subsequently obtained a permanent position at UAB hospital. Kevin subsequently pursued a Ph.D. in physics at Georgia Tech, which he obtained in the summer of 2011. His area of research was experimental non-linear dynamics, specifically, using a laboratory Rayleigh-Benard fluid convection system to explore the role of local defects in driving global chaos. This system is a very simplified but useful model of convection dynamics in weather so in parallel, they were actually doing “forecasting” by taking images (measurements) of the convection patterns and feeding them back into a theoretical model built upon the governing equations.

Adam Perkins graduated from UNI in 2005 with a B.S. in Physics. His undergraduate research work on capillary waves was done under the supervision of Dr. Fred Behroozi (now professor emeritus). He subsequently pursued a Ph.D. in physics at Georgia Tech, which he obtained in the summer of 2011. His area of research was experimental non-linear dynamics, specifically, using a laboratory Rayleigh-Benard fluid convection system to explore the role of local defects in driving global chaos. This system is a very simplified but useful model of convection dynamics in weather so in parallel, they were actually doing “forecasting” by taking images (measurements) of the convection patterns and feeding them back into a theoretical model built upon the governing equations.

Adam Perkins is now working at the Virginia Tech Research Center in Hampton, Virginia. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at l’Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his Ph.D. work was funded by the FP7 Marie Curie ITN project “GRESIMO” (Best training for Green and Silent Mobility). His research focuses on phased geometrical acoustics methods, room acoustics, auralization, absorption measurements and vibro-acoustics. Matt currently works on vehicle flight acoustics at NASA Langley Research Center in Hampton, Virginia.

Matt Boucher

Matthew Boucher (born in Des Moines, IA) graduated from the University of Northern Iowa (BA in Physics and Music) in 2004. His undergraduate research with Emeritus Prof. Roger Hanson focused on string vibrations. After receiving a Masters in Music at Indiana University (Bloomington, IN), he worked as a musical instrument craftsman at S.E. Shires, Co. (Hopkinton, MA), where he created custom design solutions and played a leading role in the construction of some of the world’s finest brass musical instruments. His graduate studies in acoustics led him to Europe where he earned a Masters in Acoustics Research at l’Université du Maine (LAUM, France) and a Ph.D. from KU Leuven (Belgium) in the Noise & Vibration Research Group of Prof. Wim Desmet. As an Early Stage Researcher, his Ph.D. work was funded by the FP7 Marie Curie ITN project “GRESIMO” (Best Training for Green and Silent Mobility). His research focuses on phased geometrical acoustics methods, room acoustics, auralization, absorption measurements and vibro-acoustics. Matt currently works on vehicle flight acoustics at NASA Langley Research Center in Hampton, Virginia.

SUPPORT THE PHYSICS DEPARTMENT

Would you like to support the Department of Physics? If so, please fill out the form below and return it to:

121 Commons, Cedar Falls, IA 50614-0239

Name

Address

City, State, Zip

E-mail

Preferred Phone

home	cell	business

Signature (required) _______________________________________ Date ________________

Online: If you prefer, you may give via our website: https://www.uni.edu/physics. Use the “Donate to Physics” button on the left side. Please enter your donation amount in the boxes, or click “Take me directly to the giving page” to contribute to any other project (enter the project name or gift intention in the area marked “Please specify designation” in the “Other” category).

$_________ directed to ________________________________

☐ My (or my spouse’s) company, _____________________________________________ (name), will match my gift.

(Please contact your HR office for details and matching gift form to be submitted with payment.)

Type of Payment:

☐ Check: enclosed, payable to the UNI Foundation

☐ Credit Card: please charge my card

$_________ beginning (mo/yr) ___/____

Please complete card information below.

Signature (required) _______________________________________ Date ________________

Credit card information will not be kept on file

Charge my:         VISA        MasterCard          Discover          American Express (please check one)

Card Number: ______________________________________________________________________________

Expiration Date:

Check: enclosed, payable to the UNI Foundation

Credit Card: please charge my card

$_________ beginning (mo/yr) ___/____

Please complete card information below.

Signature (required) _______________________________________ Date ________________

Credit card information will not be kept on file

Charge my:         VISA        MasterCard          Discover          American Express (please check one)

Card Number: ______________________________________________________________________________

Expiration Date:
ALUMNI INFO REQUEST

LET’S HEAR FROM YOU!

Let us know what you have been up to. You can email us at physics@uni.edu or return this form to:

Department of Physics
University of Northern Iowa
215 Begeman Hall
Cedar Falls, IA 50614-0150

First Name ___________________ Last Name (maiden) ________________
Address _____________________________________________________
City ________________________________ State______________________
Email:___________________________________________________________

Please share any news about you or your family to be included in the next Physics Newsletter.

The University of Northern Iowa does not discriminate in employment or education. Visit uni.edu/policies/1303 for additional information.