Albion College

www.albion.edu/mathcs | Fall 2018

# Mathematics and Computer Science

# Message from the Chair

Once again, I can report that there is much to be excited about in the Mathematics and Computer Science Department. Earlier today as I write this, the College's Curriculum and Resources Committee approved our department's proposal to reinstate a major in computer science. We are optimistic that this proposal will soon be approved by the full faculty and that the new major will be up and running before the academic year ends.

Central to the success of the computer science major will be our new colleague, Buket Aydas. Dr. Aydas recently completed her doctorate at the University of Wisconsin-Milwaukee, and is developing new courses in cybersecurity and parallel programming which will enhance the CS curriculum as the major comes back online.

Last spring, the Albion faculty approved our proposed 3-2 program in actuarial science, a partnership with Michigan State University that Darren Mason spearheaded and now oversees. We continue to see many strong mathematics students interested in the actuarial profession.

The revolving door of sabbaticals continues: as Dave Reimann returns from a spring semester working on mathematical art, Paul Anderson is away this fall collaborating with MSU colleagues. Drew Ash has been elevated to a full-time visiting position.

The third edition of the Moore Math Marathon welcomed its largest group of 9th and 10th graders last spring, with teams from the Battle Creek Area Mathematics & Science Center and the Clinton School taking top honors. Karla McCavit continues to provide excellent leadership for this event.

# Faculty News

**Paul Anderson**
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On sabbatical this semester.

**Mark Bollman, Chair**
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My second gambling math book, *Mathematics of Keno and Lotteries*, was published in April 2018. I had the great honor on June 1, 2018 of being inducted into the Academic Hall of Fame at my old high school, Allen Park HS in Allen Park, MI. I got to give a brief address at Commencement, during which I did not talk about math very much. This kicked off a summer spent researching casino carnival games with an eye on another book project. It turns out that there are lot of unusual games that have made it to casino floors, and much interesting math lies beneath those games. My ongoing quest to bring mathematics to Albion's Honors Program continues this semester with the fourth version of Great Issues in Humanities: Perspectives on Gambling.

**Darren Mason**
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During the 2017-2018 academic year, I served as interim chair of the Mathematics & Computer Science department while Dr. Bollman was on sabbatical. As part of my departmental service I helped lead a successful national search for a new professor of computer science – Dr. Buket Aydas. During this period, I also led the establishment of a new dual-degree program in actuarial science (AS) at Albion College. Students in this novel and innovative program first spend three years at Albion studying the

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# Faculty News
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mathematics, statistics, computer science, and economics & finance needed for a solid foundation in AS. Participating students then transfer to an advanced program at a major university (MSU is used as as current recommended program) to study AS at the level required to pass (nearly) all exams required for ASA certification by the Society of Actuaries. I also taught Math 313 – Financial Mathematics for Actuaries at Albion College for the first time in spring 2018; this class contains material critical to preparing for the

new IFM exam offered by the SOA. Finally, in summer 2018, I visited Guangzhou University in China and taught interest theory (annuities, bonds, amortization, and interest rate structures) and financial engineering (vanilla & exotic derivative pricing in discrete time (binomial asset pricing models) & continuous time (Black-Scholes theory, Greeks, and hedging methods). During my stay I was able to participate in a small part of graduation that gave me a chance to reconnect with students from my first visit in summer 2016. I truly enjoyed the experience and am currently exploring development of a study abroad program with Guangzhou University for Albion College and MSU students.

**Heather Jordon**
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Last year was my second year at Albion and I had the opportunity to teach Calculus II, Abstract Algebra, Discrete Structures, and a topics course entitled "Abstract Algebra II" during the spring semester. During the Fall 2017 semester, junior Albion student Nichole Brown completed a Directed Study in Skolem Sequences which resulted in an article we recently submitted for publication. Nichole spoke on her topic at Elkin Isaac in the spring of 2018 and is now writing a thesis for the academic year, 2018-2019. Senior Henry Carnick also wrote an honors thesis under my direction entitled "Ramsey Theory: Graph Theory Edition." Henry also spoke on his topic at Elkin Isaac in the spring and is now in a mathematics graduate program at the University of Illinois in Champaign-Urbana.

Between the Fall 2017 and Spring 2018 semesters, I attended and presented at the Joint Mathematics Meetings in San Diego, CA. Nichole and Henry, along with several Albion students, went along and greatly enjoyed not only the mathematics but the lovely California weather in January. In March of 2018, I also attended and presented at the 49th Southeastern International Conference on Combinatorics, Graph Theory, and Computing at Florida Atlantic University. Two research articles on which I am a co-author appeared this past year, one in the *Australasian Journal of Combinatorics* and one in the *European Journal of Combinatorics*.

This academic year, I am teaching Calculus II, Abstract Algebra, and Discrete Structures, all of which are some of my favorite courses to teach. As we did last fall, in Abstract Algebra, the students are presenting problems on the board nearly every week. Previous students found this experience greatly increased their learning when they had to not only write a solution but also speak about it. I look forward to continuing this practice in the years to come.

For fun over the summer of 2018, I traveled to Europe for two weeks and went to Prague, Krakow, Vienna and Dubrovnik. It was a lovely trip and I look forward to doing more travel in the future.

**Karla McCavit**
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My projects over the last year include developing and implementing student support services as well as teaching courses in the department. Current projects include work on the Moore Math Marathon, performing ongoing work with math placement and advising around math placement, and developing and teaching a new course this fall. In addition, my work in Quantitative Studies continues to support students in E&M, Mathematics and the Sciences, and I've been teaching Mathematics Essentials, Precalculus, Calculus, and Differential Equations With Linear Algebra in the DMCS.

**David Reimann**
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In addition to teaching mathematics and computer science courses, I continue to create mathematical and technology based art, with the broad goal of using visual art to stimulate interest in mathematics. I gave a presentation coauthored by (Antoniu Fodor, '18) and exhibited artwork at the Joint Mathematics Meetings held January 2018 in San Diego. With help from Mark Bollman and Heather Jordon, I organized for seven students (Daniel Bryan, Nichole Brown, Henry Carnick, Antoniu

Fodor, Justin Leeds, Claire Ostrowski, and Brandon Wade) to attend the conference. In March, I co-curated a mathematical art exhibition at the Tri-sectional meeting of the Illinois, Indiana, and Michigan sections of the Mathematical Association of America, where I also exhibited artwork and led a build of the sculptural piece "Tri-section Tribute." In July I attended the annual Bridges conference on mathematical art in Stockholm, Sweden, where I gave a talk, exhibited artwork, and led a sculpture build. In August I gave a public lecture/workshop at the National Museum of Mathematics (MoMath) in New York, New York; the following day I led a hands-on construction of the sculptural piece "Goldberg Variation", one of many participatory activities at the MoMath NYC Math Festival. I continue to provide cover art for Mathematics Magazine, a publication of the Mathematical Association of America. A sabbatical leave during the 2018 Spring semester allowed me to focus on my research; I am writing software that combines group theory, linear algebra, and computer graphics to create imagery that uses symmetry to illustrate abstract concepts in group theory. My wife Amy ('00) and I have been conducting and publishing interviews with other contemporary mathematical artists to document and help draw attention to their work. We are still living in Albion and enjoy spending time with our two young grandsons. I also enjoy cycling around the scenic Albion countryside with a group of friends including retired professor Ron Fryxell.

**Drew Ash**
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During the summer of 2018 I was fortunate to accompany my spouse, Dr. Brade in the History Department, on her research trip to Prague, Czech Republic and London, England. Over the six weeks were in in Europe and England I continued my research in topological speedups as well as research assistant for Dr. Brade.

I am thrilled to be back at Albion for a second year! I am most looking forward to teaching Real Analysis in the spring semester, giving talks and attending colloquium, as well as sharing the beauty of math with my calculus and college algebra students. One day, I hope to convince a student or two to try an undergraduate research project with me! Go Brits!

**Buket Aydas**
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As a new faculty member in the Mathematics and Computer Science Department, I am very excited about working with students and teaching Computer Science at Albion. After earning a B.S. degree in Computer Science from Middle East Technical University in Turkey, I earned a Ph.D. in Biomedical & Health Informatics from University of Wisconsin-Milwaukee. I taught several courses at UW-Milwaukee, such as Introductory Computer Programming, Database Systems, Computer Organization, Artificial Intelligence, and Human-Computer Interactions.

My primary research focuses on application of clinical research informatics and data analytics methodologies on medical decision-making problems. I have worked on several projects initiated by the research stream in the Biomedical and Health Informatics Research Institute (BHIRI) at the University of Wisconsin-Milwaukee, in which we collaborated with various departments, corporations, and universities including regional medical schools. I am interested in studying data analytics and mathematical models, as well as decision-making problems in a broader sense. My primary methodological and computational research interests include stochastic mathematical models, simulation, artificial intelligence, and machine learning. I developed a personalized self-management tool for diabetic patients as part of my dissertation. My approach was to build a discrete event simulator, which represented the physiological behavior of glucose metabolism in humans. Now, I am working on a joint project with Beaumont Health System which we make personalized predictions on some serious diseases like pancreatic cancer, pediatric concussion, and Alzheimer with the help of genomics and metabolomics data by using artificial intelligence data analysis tools such as deep learning. This year, I was awarded as a Baxter Young Investigator for my work on the personalized self-management tool for diabetic patients. Baxter's Young Investigator Awards reward researches applicable to the development of therapies and medical products that save and sustain patients' lives.

This fall I am teaching Algorithms and Introduction to Computer Science 1 and I am very much looking forward to getting to know the students in the department and on campus.

# Alumni News

**Donald Chandler, '77**
I had fun coming back for Homecoming 40th reunion and to see where in the halls they stuck the Math Award plaque... Class of 77 - We found it — looks like it got moved since my 30th reunion!!!


In my days, the Math Dept. was Drs. Moore and the three "L's" WenzL, FryxL, and WinkL... we transitioned the computers from keypunch cards to teletypes, and I got my first hand-held calculator my freshman year and never had to use a slide rule like I did in High School !!!

I just retired after 40 years as an Engineer at General Motors. I worked

as a Quality Engineer for the plant here in Grand Rapids. I probably put my Stat classes to much more use in my career than Calculus, Linear Algebra, Abstract Albegra, Non-Euclidean Geometry, etc, but I loved digging deep into that stuff, and I think it trained my mind to solve problems and think logically.

**William Green, '05**
I was promoted to Associate Professor in the Department of Mathematics at Rose-Hulman Institute of Technology this fall. In 2017 I was awarded a five year Simons Collaboration Grant from the Simons Foundation to further my research on partial differential equations. I live in Terre Haute, Indiana with my wife Sylvia and our children Maggie and Robert.

**Phil Thorson, '03**
My family and I just moved back to the Midwest. We moved from Oregon to the Cleveland Ohio area, where I work managing the Auto insurance rates for two states for Farmers Insurance (www.farmers.com/careers/internships/)

**Dustin Turner, '06**
Dustin Turner is a Vice President and the Chief Actuary of Intrepid Direct Insurance, a subsidiary of W.R. Berkley Corp. He has attained Fellowship in the Casualty Actuarial Society and is a member of the American Academy of Actuaries. My responsibilities at Intrepid Direct include broad oversight of pricing, reserving, financial and capital modeling and business strategy.

**Whitney Patton Turner, '09**
Whitney Patton Turner is an Adjunct Professor at Johnson County Community College and Metropolitan Community College in Kansas City. She earned a Masters from University of Connecticut in Pure Mathematics and has worked at several colleges in Michigan and Illinois, before moving to Kansas.

## Advise for current Math/ CS Majors & Minors:

**William Green, '05**
Learn how to learn. The beauty of a mathematics, and more generally a liberal arts, education is learning how to solve problems and effectively communicate solutions. In mathematics, you learn to break large complicated problems into smaller, more manageable pieces and build flexible and adaptable techniques and ideas to best solve them. You may never need to solve a differential equation, analyze a historical document or read a poem professionally. But the skills you are developing: learning how to approach new problems, understanding new ideas, perspectives and techniques, and learning how to make these new skills your own is an invaluable skill. The job you will be doing in 15 years may not yet exist, if you have learned to become an effective learner, you will be well prepared for whatever the future holds. In addition, learning how to program, compute and utilize computing power effectively can only help open up options for you in the future.

## Scholarship/Award Winners Spring 2018

**Sleight:** Oana Vesa, Henry Carnick
**Bragg:** Nichole Brown, Kendra Cook, Nathaniel Frieswyk, Claire Mitchell
**Fryxell Scholarship:** Jerremy Russikoff
**Lancaster:** Liliya Chernysheva, Nickolas Kinachtchouk

## 3rd Annual Keith Moore Math Competition:

Seven teams competed in the 2018 Moore Math Marathon (MMM), an annual event at Albion College that brings area high schoolers to campus for a day of mathematics and fun. The competition involves 9th and 10th grade students who work in teams as well as individually in various events. The results were:

**Large school division**
1st: Battle Creek Area Math and Science Center
2nd: Macomb Math and Science Tech Center (Team 1)
3rd: Macomb Math and Science Tech Center (Team 2)

**Small school division**
1st: Clinton
2nd: Grass Lake
3rd: North Central
4th: Will Carleton Academy

The event is named in honor of W. Keith Moore, beloved member of the DMCS from 1952 to 1986. Dr. Moore passed away in 2014 at the age of 91.

The 2019 MMM is scheduled for Friday, May 10. Additional information may be found online at tinyurl.com/jbkrlg5 .