





# COLLEGE of CHARLESTON

This newsletter is a production of the Department of Mathematics at the College of Charleston. It was edited by Alex Kasman. Write to him with news to include in future issues, questions or concerns at [kasmana@cofc.edu](mailto:kasmana@cofc.edu).



L to R: Wendy Sheppard, Mukesh Kumar, Tom Ivey, Rohn England, and Kathy Thom.

## Faculty Arrivals and Departures

We are pleased to welcome **Wendy Sheppard** who has been hired as an instructor and **Mukesh Kumar** who has been hired into a tenure track professor line. Although their job titles are new, both have taught here previously and so are probably familiar faces to our students.

We are also happy to welcome back Professor **Tom Ivey** who is returning from a two year position as Geometric Analysis Program Officer at the National Science Foundation in Washington DC.

At the same time, we bid a fond farewell to two retiring faculty members: Dr. **Rohn England** and Prof. **Kathy Thom**. The CofC math department is *grateful* to them both for their many years of dedicated service to the College and its students.

## Charleston Was Well Represented at MCCCC31

The 31st *Midwestern Conference on Combinatorics & Combinatorial Computing* held in Carrollton, Georgia featured talks by two CofC students. **Blaine Billings** and **Aidyn Trubey** each presented papers at the conference. So did **Kasifa Namyalo** who is a PhD student at Mbarara University of Science and Technology in Uganda but also also held the title of scholar in residence at the CofC math department. They are shown here with CofC Professor **Dinesh Sarvate** who supervised all of their research projects, and Professor **Li Zhang** of the Citadel.



## Students:

Three students – **Joseph Casagrande**, **Emanuel Valencia**, and **Zachariah Wirszyła** – shared this year's *Susan Prazak Endowed Award for Future Teachers*.

**Blaine Billings**, a triple major in computer science, mathematics and Spanish, was named a *Goldwater Scholar* for the 2018-2019 academic year and also received the 2018 *Ewa Wojcicka Award* from the Department of Mathematics.

The *Scott Ward Award for Excellence in Mathematics* for 2018 went to **John Cobb**.

**Xandre Clementsmith**, a triple major in data science, psychology and mathematics, was recently awarded the prestigious SMART Scholarship from the U.S. Department of Defense.

The award for Best Undergraduate Research Poster went to **Grier Jones** and **Daniel Rich**.

The following students were all recipients of the *Outstanding Student Award from the Department of Mathematics for 2018*: **Tristan Aft**, **Katherine Balcewicz**, **Gloria Burke**, **Blaine Billings**, **Joseph Casagrande**, **Emma Collins**, **Elyana Crowder**, **Na Duong**, **Katelynn Huneycutt**, **Isabel Johnston**, **Choral Linhart**, **Tea Luu**, **Mahwish Rana**, **Orel Robino**, **Payden Shaw**, **Elaine Todd**, **Emanuel Valencia**, and **Spencer Wilder**.

Last but not least, **Sonia Kopel** was recognized as our *Outstanding Graduate Student*.

## Alumni

**Katie Balcewicz** (BS '18) is now a Data Engineer at *Tresata Software* in Charlotte.

**Gloria Burke** (BS '18) has begun working as a Product Management Analyst at *Allstate* in Bridgewater, NJ.

**Elyana Crowder** (BS '18) is starting grad school at *Georgia Tech* in Atlanta where she will be pursuing a PhD in physics.

**Chris Ewald** (MS '18) is working at investment manager *Two Sigma* in New York.

**Patrick Ging** (BS '18) will be teaching at *West Ashley High School* and also working towards a master's degree in mathematics here at CofC.

**Na Duong** (BS '18) is in our 4+1 program and so is staying one more year at CofC to earn a master's degree in statistics.

**Katelynn Huneycutt** (BS '18) is entering the PhD program at the *University of Maryland - Baltimore County* where she will study applied math.

**Muhammad Khan** (MS '18) is working for *Boeing*.

**Sonia Kopel** (MS '18) has just started work as a data scientist with *Citigroup*.

**Austin Mishoe** (MS '17) has been hired into the Data Analytics Group at *MUSC*.

**Michael Muscato** (MS '17) was recently hired at *Momentive Performance Materials*.

**Nick Orletsky** (MS '18) is working at *SPAWAR*.

**Kaitlyn Schwartz** (MS '18) is teaching at the *Naval Nuclear Power School*.

**Kim Stubbs** (MS '18) will be working towards her PhD in mathematics studying celestial mechanics at the *University of California, Santa Cruz*.

**Hannah Swinbank** (BS '18) will be teaching at *Wando High School* in Mount Pleasant.

**Zach Wirszyła** (BS '18) is working towards a Masters in Science and Mathematics in Education for Teachers through the Graduate School here at CofC.

## Faculty

CofC Math Professor **Renling Jin**, whose research finds amazing applications of deep results in logic to other areas of math was awarded a *Collaboration Grant from the Simons Foundation* through August 2022.

**Mukesh Kumar** received support from India's Ministry of Human Resource Development to give a short course on "Isogeometric Methods using B-splines and NURBS" at the *Indian Institute of Technology in Varanasi*.

**Alex Kasman** is representing the American Mathematical Society on the national *Committee on the Undergraduate Program in Mathematics*.

An NSF grant proposal by **Ben Cox** (along with **Annalisa Calini** and **Bob Mignone**) has been recommended for funding. The grant will support the *CBMS Regional Conference on Topological Data Analysis* hosted by the College of Charleston in May 2019 featuring principal lecturer Professor **Gunnar Carlsson** of Stanford University and Ayasdi Inc.



### “Hidden Figures” at CofC

The Math Department and Lowcountry Hall of Science and Math jointly sponsored a free showing of the film “Hidden Figures” on campus in February 2018. This is a wonderful movie based on the true story of the African-American women who worked as mathematicians for the US space program in the 1950’s and 1960’s.

Before the film, there was a panel discussion featuring **Marile Colon Robles** of NASA, CofC’s OID Director **Renard Harris**, the math department’s Professor **Alex Kasman**, geology professor **Cass Runyon** who directs the SC NASA Space Grant, and Professor **Jennifer Wilhelm** from psychology. The discussion and the film showing were both a big success.

Mathematician **Rudy Horne** (Morehouse College) worked as a consultant on the film and was supposed to also be in Charleston to speak to a class of CofC students and to participate in the discussion. Sadly, Professor Horne died unexpectedly in December. However, we continued the event in his honor and used it as an opportunity to express our gratitude for his role in ensuring that math was accurately portrayed in the movie.



### Math Meet 2018

On February 24, 2018, our annual High School Math Meet was attended by over 400 students from 37 schools from the Carolinas and Georgia.



This year’s Math Meet coincided with the 2018 Winter Olympics. So, our tee-shirts featured Clyde the Cougar skiing down a snowy slope and several of our events featured the Winter Games.

The following teams earned top marks on the Level 3 Written test, one of our most difficult events:

- Honorable mention: Gaston Day School
- 3rd place: Academic Magnet High School
- 2nd place: Charlotte Math Club
- 1st place: NCSSM

A complete list of winners is posted at [mathmeet.cofc.edu](http://mathmeet.cofc.edu).

Can **you** answer these Math Meet 2018 problems?

1. What is the sum of all the positive integers that evenly divide 2018?
2. If an equilateral triangle and a regular hexagon have the same perimeter, what is the ratio of the area of the triangle to the area of the hexagon?

(Answer: 1. 3030 2. 2 to 3.)

### Mathematical CofC Snacks Get National Exposure

This photo by Professor **Annalisa Calini** shows the 2-holed bagels (each with a basis for its fundamental group) that were served at a CofC event. It appeared in an issue of the *Notices of the American Mathematical Society* as part of a caption contest. The winning caption is shown here below the picture.



“Okay, who’s the genius that gave these bagels the wrong genus?”

Photographed and submitted by Annalisa M. Calini.

## Graduate Program News

CofC has offered Master's Degrees in mathematics for decades and has recently added a statistics concentration and a "4+1" program through which undergraduate students can earn a bachelor's degree and a masters degree in mathematics in only 5 years. This fall, the program will welcome one of the largest and strongest incoming classes with 16 degree-seeking students. These include two recipients of the newly established Principal's Fellowships, an international student from Chile, a graduate of Columbia University Neuroscience and Education MS program, and four outstanding CofC 4+1 students.

All of these Master's degree programs have proven to be tremendously successful at preparing students for careers or PhD programs beyond CofC. (See the alumni accomplishments on page 3!) However, a recent change opens up an exciting new possibility that we are also pursuing.

The state-level rules prohibiting CofC from offering its own PhDs have been removed. We are therefore looking into the possibility of running a small, very student-focused math PhD program which would operate synergistically with our existing undergraduate and Master's degree programs.

For more information,, please contact the program co-directors at [calinia@cofc.edu](mailto:calinia@cofc.edu) and [jonesm@cofc.edu](mailto:jonesm@cofc.edu).

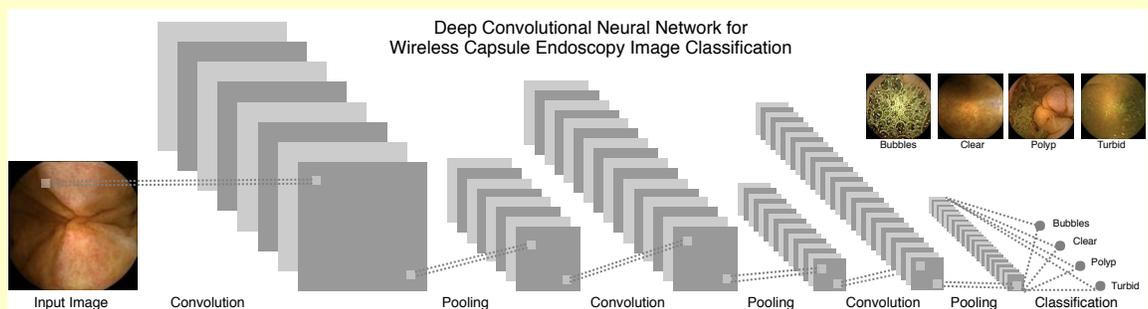
## Some Summer 2018 Student Research Projects

CofC professors are not just teachers but also practitioners of their fields. Our students learn history from historians, psychology from psychologists, math from mathematicians, and so on. Not only does this guarantee that the instructors are experts with practical knowledge of their discipline, it also means that undergraduates here have a rare opportunity to work on real research with their professors. Here are just two of the research projects being conducted in the math department this summer:

Undergraduates **Monique Sparkman** and **John Cobb** along with graduate student **Albert Serna** and Professor **Alex Kasman** are studying the particle-like waves called "solitons", but instead of the usual real-valued functions, the *solitons* they are studying are described by *quaternions*, abstract numbers that do not satisfy the familiar commutative property. Since waves and non-commutativity are both fundamental to quantum physics, studying this combination could someday have practical value, but for now this team is happy to simply have made some surprising discoveries about how these two ideas fit together mathematically.



In a project with medical applications, undergraduate **Michael Lanier** is working with Professor **Mukesh Kumar** to mathematically analyze wireless capsule endoscopy (WCE) images to identify cancerous polyps automatically. Utilizing the mathematics of *deep learning* and *neural networks* (see figure), Lanier and Kumar hope to help doctors combat the third most common cancer in the US through early WCE detection.



**Mission Statement:** Mathematics is an art, a pure reflection of the human mind. Mathematics is the language of science. It provides powerful tools for understanding our world. Mathematical reasoning and the critical thinking skills that develop with the study of mathematics are foundational necessities for an educated workforce and citizenry in the 21st century. In support of these principles the Department of Mathematics will offer a varied curriculum with flexible programs. The Department will recruit a distinguished faculty of dedicated teacher-scholars, who through teaching seek to impart mathematical knowledge, skills, and critical reasoning, as well as a sense for the utility and beauty of mathematics; and through scholarship will seek to fulfill the professional responsibility of expanding mathematical knowledge and applications, while providing students opportunities for original research. All mathematics courses, whether a part of the general education core curriculum; degree requirements in the sciences, social sciences or business; or for mathematics majors, will have as a goal a transformational learning experience. Students majoring in mathematics will benefit from small classes, personal attention, and a curriculum that allows for concentration in several key sub-disciplines and pre-professional tracks, preparing them for a variety of careers, further study at the graduate level, and the pursuit, for its own sake, of learning the oldest of the liberal arts.

## A Message from Bob Mignone, Math Department Chair



The College of Charleston, like public institutions throughout the country, are increasingly called upon to rely on non-tax based sources to operate and maintain the levels of quality, value and impact that their students, alumni and communities expect. Now more than ever philanthropic giving is critical for us to continue to achieve our goals of education and service to the community. Please consider giving to one of these four funds:

R330 General Math Department Fund

R342 Ewa Wojcicka Memorial Math Award Fund

R520 Math Graduate Program

E373 Prazak Award for Future Math Teachers

You can make a donation via credit card by visiting <http://giving.cofc.edu/math>.

Or you can pay by check and mail it to *College of Charleston Foundation / 66 George Street / Charleston, SC 29424*. (Make your check out to "College of Charleston Foundation" and be sure to indicate the fund that you are donating to in the memo and in the cover letter.)