

Summer 2014

Dear Friends of Tufts Physics & Astronomy,



For more than 45 years we've been a department divided – between Robinson Hall and the Tufts Science and Technology Center (and Bacon Hall before that). We've made the best of it, but always dreamed of reunification. By Fall 2015 that dream will be a reality, as we relocate to newly renovated space just across the train tracks from STC – all our faculty, students, staff, research labs, and most of our teaching will be under one roof. Throughout this year many individuals have worked hard on the building's design to make sure it will serve our needs and strengthen our community and our educational and research missions for many years to come. Meanwhile, our faculty and students continue to grow and excel, as you can read below.

## Our Ever-Evolving Department

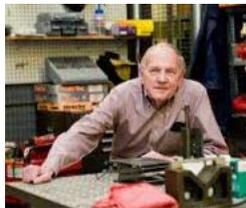
### Addition

*Professor Nathan Lowhorn* joined the department this year as a Part-Time Lecturer. Professor Lowhorn, a graduate of Clemson University, has been teaching Physics 0012 this year to enthusiastic groups.



### Goodbyes

We bid a fond farewell to *Professor José Blanco-Pillado* who has opted to return to Spain in order to be closer to his family. He continues to collaborate with the Tufts Cosmology group on research. We wish José the very best of luck in his new endeavors.



We also sadly say goodbye to *Laurence (Larry) McMaster*, who passed away in April. Larry joined Tufts Physics-Astronomy in 1965 as a staff technician. Over time, encouraged by Profs Milburn and Schneps, Larry developed an appetite for innovation and the facilities to enable it. Having seen outstanding shop facilities at other universities and national labs, Larry was ready for the opportunity to create the University Shop at the Science &

Technology Center, which he managed from its creation in the 1980s until his retirement in 2011. Faculty and students knew Larry as the 'go-to guy' for designing, fabricating, renovating, or salvaging scientific instruments of all kinds, from manufacturing projects for large-scale high-energy physics experiments at international facilities, to

smaller projects in support of the condensed matter physics group and researchers from other departments. Larry's pragmatic approach to problem-solving was backed up by the quiet conviction that creativity can surmount many obstacles. He communicated both that pragmatism and that conviction to students, faculty, and co-workers. In 2011 his Machine Shop Team was recognized for their outstanding service with a Tufts Distinction Award. Larry will be fondly remembered by past and present citizens of Physics-Astronomy as a fine teacher of lessons that cannot be found in any course catalog. He is survived by his wife, Karin, two sons and a daughter and their families.

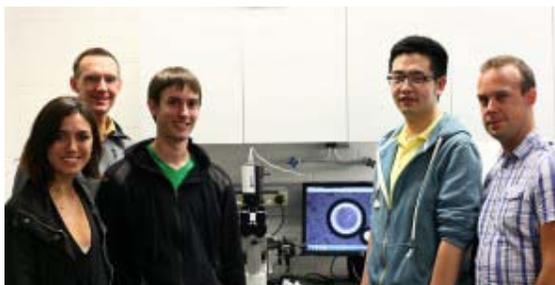
## News and Events

### Department Looks Forward to New Space

This past year, members of the department have been involved in the planning of a new Physics and Astronomy space in Tufts' newly renovated 574 Boston Avenue building. The new space will include plenty of open space and natural lighting, new teaching labs, a newly built Knipp Library, and our very own bathrooms! We look forward to moving to the new space in the summer of 2015.

### Soft Matter Theory Goes Down Under to Collaborate with Experimenters

Courtesy of a Tufts University [International Research Grant](#), members of the department's Soft Matter Theory Group traveled to the University of New South Wales in Sydney, Australia this past year. Working with the experimental group of Patrick Spicer, in Chemical Engineering studying emulsions, the Tufts group focused on how best to connect their theory to Spicer's experiment. Check out their blog at: <http://sites.tufts.edu/softmattertheory/>.



From left: Kate Voorhes, Patrick Spicer, Chris Burke, Zengyi Wei, Tim Atherton



### Students Attend the APS Northeast Conference for Undergraduate Women in Physics (CUWiP)

This past January, a group of three Tufts undergraduate physics women attended the Northeast Conference for Undergraduate Physics at Brookhaven National Laboratory for a three-day regional conference that brought together more than 100 undergraduates for scientific presentations, panel discussions, tours of the laboratory, and lots of opportunities for informal interaction and networking. Their travel was supported with funds from the Kathryn McCarthy Endowed Lectureship Fund.

### **Experimental Modern Physics Gets an Upgrade**

The Experimental Modern Physics lab (Physics 64) received a significant technology upgrade this year, allowing students to explore fundamental physical phenomena in higher detail and better precision. Focused on replacing antiquated equipment, making experiments more transparent and less prone to equipment error, and integrating computational tools where possible, these new acquisitions enhance students' ability to perform more detailed experiments and analyses.

### **A Year of Distinction**

#### **Physics Team Awarded 2014-2015 *Tufts Innovates!* Seed Grant**

Professor Timothy Atherton and graduate student Christopher Burke have been awarded a *Tufts Innovates!* seed grant for the 2014-2015 academic year to develop and implement a student-centered, interdisciplinary, and project-based course in computational physics – a topic much requested by students and faculty alike. The course will equip students with the skills to identify a range of computational approaches to solve a problem, design and implement functional computational solutions, and interpret output using statistical methods.

### **Faculty and Staff**



This year, *Professor Peggy Cebe* was honored by her undergraduate alma mater, Edinboro University of Pennsylvania, with the College of Science and Health Professions Distinguished Alumni Award. She gave the keynote address at Edinboro University in conjunction with Research Day, a Celebration of Scholarship. Professor Cebe was also honored by Tufts University as the recipient of the Tufts University 2014 Graduate School of Arts and Sciences (GSAS) Faculty Mentoring Award. She will be honored on April 25<sup>th</sup> at the Graduate Awards Ceremony. *Professor Roger Tobin* was named a fellow of the AVS (formerly American Vacuum Society) for “outstanding contributions to understanding the dynamics of energy transfer between adsorbates and metal substrates, and chemical reactions and electronic effects on stepped surfaces.”

### **Students**

This year's senior class proudly sported quite a few awards, including *Ellen Garven* ('14) who received the Class of 1942 Prize Scholarship, *Noah Kurinsky* ('14) who was awarded the Benjamin G. Brown Scholarship, *Samuel Hansen* ('14) who received the Amos Emerson Dolbear Prize, and *Matthew Weins* ('14) and *Kate Voorhes* ('14) who both received the N. Hobbs Knight Prize. Additionally, students *George Wojcik* ('15) received The Prize Scholarship of the Class of 1882 and *Isabel Yannatos* ('15) was awarded the Audrey Butvay Gruss Science Award.

## **In the Spotlight**

### **Shannon Curry, A'04**

#### **Current occupation?**

I am currently a post-doc at UC Berkeley in the Spaces Sciences Laboratory working on NASA's next Mars Scout- MAVEN (Mars Atmosphere and Volatile EvolutionN).



#### **How do you use your physics background in your line of work?**

Physics is part of my daily life because my primary area of research is developing computer simulations of planetary atmospheres. The solar system environment, specifically the interaction of the Sun or a star with a planetary atmosphere, is really complex; building a simulation that describes it well requires bringing a number of different areas of physics together (plasma physics, fluid dynamics, radiative transfer and electromagnetism). Learning how to solve problems with physics is incredibly rewarding, and we are really lucky to live in an era of technology where we can actually 'test' how physics works in space by taking in-situ measurements at places like Mars and Venus.

#### **Did the Tufts physics department prepare you for your current career?**

It absolutely did- in fact I wish I had taken better notes because when I began my Ph.D. four years later, there was no transition period and we were expected to have a really solid base from day one. In addition to the academics, I really appreciated the research opportunities that Tufts provided or encouraged. My research as an undergraduate was actually at the Harvard Smithsonian Center for Astrophysics using Chandra data (with the encouragement of my adviser, Austin Napier) since not many of the faculty at that point were doing data analysis in x-ray astrophysics. Starting research as early as possible was enormously helpful later on in graduate school and now as a research scientist!

#### **What is your favorite memory of your time in the Tufts physics department?**

I really, really enjoyed taking Modern Physics with Gary Goldstein and Quantum Mechanics with Roger Tobin the same semester. For the first time, I saw the world in a completely different way and could discuss that with really fantastic, thoughtful people. I also remember taking astrophysics classes with Bill Waller and he had incredible stories about observing that inspired me to spend a semester near Kitt Peak.

## **Congratulations!**

The department would like to congratulate our 2014 graduates. With 14 graduating seniors, this is our largest class since 2008.

### **Bachelor of Science Degrees**

**Thomas Atmer**, B.S., Chemical Physics

**Shelby Bean**, B.S., Physics

**Amelia Downs**, B.S., Physics

**Ellen Garven**, B.S., Physics/Mathematics

**Samuel Hansen**, B.S., Physics/Mathematics

**Eli Kohlenberg**, B.S.EP., Engineering Physics/  
Computer Science

**Noah Kurinsky**, B.S.EP., Engineering Physics/  
Astrophysics

**Daniel Lange-Vagle**, B.A., Astrophysics

**Ryoma Morisaki**, B.S., Physics

**Reilly Nathans**, B.A., Physics/Mathematics

**Robert Rockmore**, B.S., Physics/Mathematics

**Krishna Soni**, B.A., Physics

**Kate Voorhes**, B.S.EP., Engineering Physics

**Matthew Wiens**, B.S., Applied Mathematics/Physics

### **Doctoral Degrees**

- **Samuel Hamilton**, High Energy Physics, Advisor: Krzysztof Sliwa  
Thesis: "*Measurement of the longitudinal polarization of the top quark in top-antitop events using the ATLAS detector*"
- **Bin Mao**, Condensed Matter Physics, Advisor: Peggy Cebe,  
Thesis: "*Thermal Analysis for Novel Polymeric Material*"
- **Konstantinos Metallinos**, Cosmology, Advisor: José Juan Blanco-Pillado,  
Thesis: "*Numerical Exploration of the String Theory Landscape*"

We are proud of your work at Tufts and look forward to the great things in your future.

Sincerely,

Roger G. Tobin  
Chair

## Tufts Physics Tidbit



Robinson Hall was built in 1900, primarily for engineering classes, though even then it also housed the small Physics Department. This photo was taken that year. The building is named after Charles Robinson, former president of the Board of Trustees. Over the years, as Tufts grew, various engineering departments relocated to newer facilities until, by 1950, only the Physics and Mathematics departments remained in Robinson. Anderson Hall was added in 1961. In 1967, the High Energy Physics group relocated to Bacon Hall, initiating the geographic split that

has persisted to this day.

**We welcome your news, stories, and ideas for our future newsletters.** To contact us or to be added to our mailing list, please email newsletter editor: [Shannon.Landis@Tufts.edu](mailto:Shannon.Landis@Tufts.edu). We would especially like to hear from recent graduates of the program (undergraduate or graduate) about what you're doing!

## Social Media Links



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