From the Chair

Let me introduce myself to you: My name is Andreas Riemann and I have been a faculty member of the Department of Physics/Astronomy for the last 11 years. Before I came to Western, I received my undergraduate degree in Halle (Germany) and my Ph.D. at the Freie Universität Berlin, Germany. After a two year stay as a post-doctoral fellow at the University of British Columbia in Vancouver, I started as a lecturer at WWU in the Fall of 2005. I became a tenure-track faculty in the following Fall and received tenure and promotion to Associate Professor in the Fall of 2011. My research area is experimental surface science where I’m looking at molecular nanostructures on surfaces using Scanning Tunneling Microscopy. I’m also interested in the morphology and properties of metallic thin films on stepped substrates which I investigate using Electron Diffraction and AUGER spectroscopy.

As you might remember from last year’s newsletter, Brad Johnson, chair of our department for the previous 13 years, became the Associate Dean of the College. I was on sabbatical in Germany for two quarters during the last academic year, came back on Thursday of Spring break and started as the new Chair on the following Monday (talk about being thrown into the deep end and asked to swim). During the last 10 months I’ve learned a lot about the workings of the department and the university, and I’m working with all my colleagues and students in order to have a vibrant, successful and inclusive department where all students, faculty, and staff are able to succeed and feel welcome. In that context, we are proud that our department was recognized with an Award for Improving Undergraduate Physics Education from the American Physical Society last Fall.

I hope you find this newsletter informative about the life of our department and you stay in contact with us. I’m looking forward to receiving updates on your whereabouts and the various paths you have taken after graduating from Western!

-Andreas Riemann

Our Seniors 2015-2016

This year’s graduates have a diverse range of plans post-WWU including traveling, working in industry, and going on to Graduate studies in Atmospheric Physics, Condensed Matter Theory, Applied Medical Physics, and Astronomy. Schools to which our students have applied and/or been accepted include University of Colorado at Boulder, University of Illinois at Urbana Champaign, Stanford, Cornell, UC Berkeley, and Duke University.

2015 Outstanding Graduate Award

Kodiak Murphy is the winner of the 2015 Outstanding Graduate Award. Throughout his time in the WWU Physics department he worked in Janelle Leger’s lab on the design, construction, and characterization of subwavelength waveguides for visible light. Kodiak was also active in outreach, diversity and community-building activities, notably through his work with the Physics Club, the Women in Physics club and the Society for the Advancement of Hispanics/Chicanos and Native Americans in Science.

Kodiak is now a graduate student at UC Berkeley where he will conduct research in atomic, molecular and optical physics.

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New faces in the department!

Dr. James Davenport: Postdoctoral Fellow

Dr. James Davenport is a National Science Foundation Astronomy & Astrophysics Postdoctoral Fellow, collaborating with Professor Kevin Covey for three years. His research program focuses on detecting explosive flares on nearby stars. To do this, James is developing new computer algorithms to analyze data from the NASA Kepler planet finding mission. This project will provide a transformative understanding of how often stars like our Sun flare over time, and will help to characterize targets for future planet-hunting missions like the James Webb Space Telescope and the Transiting Exoplanet Survey Satellite.

Dr. Davenport is also involved in a wide range of research collaborations studying stars with the latest computational techniques and big datasets. While at Western, he will also run a seminar for upper division science students on open source data science tools and techniques.

James graduated with a PhD in astronomy from the University of Washington in 2015, and previously studied at San Diego State University. James is the author of the science and data visualization blog IfWeAssume.com. He loves drinking coffee, traveling, attending the Seattle Opera, and walking his dog.

Dr. Regina Barber DeGraaff: Diversity and Outreach Specialist

Dr. Regina Barber DeGraaff is a lecturer in the WWU Physics and Astronomy Department and is also a WWU physics alumna. During her three years teaching at WWU, Dr. Barber DeGraaff also devoted time to supporting outreach and inclusion in STEM (Science, Technology, Engineering, and Mathematics). During her second year, the new Dean of the College of Science and Engineering (CSE) created a position that would be devoted to these efforts. Thus, the STEM Diversity and Outreach Specialist position was born. Part of Dr. Barber DeGraaff’s day is spent prepping and lecturing in the classroom while the rest of her time is spend striving to create a welcoming culture at WWU to anyone who wants to be a scientist, mathematician or engineer.

The main goals of the STEM Diversity and Outreach Specialist are to cultivate and maintain partnerships with the student body, the faculty (in CSE & other colleges) and to utilize the networks inside and outside WWU to increase inclusion and equity in the STEM fields. Lastly, Dr. Barber DeGraaff is working toward a time where every CSE department feels comfortable in addressing and discussing why significant portions of our student body and our country are not represented in our classrooms.

Congratulations! Faculty Sabbaticals for next year!

Janelle Leger will be taking a year-long sabbatical during the 2016/17 academic year that will involve working in her own laboratory at WWU as well as building new collaborations at the University of Washington and Pacific Northwest National Labs.

In addition to continuing to pursue a number of currently funded projects, she will be developing several new lines of research including the development of plasmonic back-contact photovoltaic devices, the characterization of conjugated polymers doped with polymerizable salts, and the exploration of polymer-nanoparticle blend organic memory devices. Her sabbatical research will support projects for around ten undergraduate research students next year.

Ken Rines will be studying optical spectra of galaxies in and around clusters of galaxies. Galaxy redshifts measure the orbital properties of clusters, enabling a mass estimate of the cluster. The evolution of orbital properties over cosmic time will help reveal the effects of dark energy on the formation of clusters.

He will also be analyzing the spectra to learn about the stellar populations of the galaxies. He will compare galaxy ages and other properties to the results of numerical simulations of galaxies in clusters being performed at the University of Washington. These comparisons will test how well the simulations reproduce the observed properties of galaxies in dense environments.
Prior to 2009, WWU physics students who were interested in studying the physics of the Earth were in something of a quandary: they had the ideal physics background to pursue these questions, but often did not have sufficient time in their schedules to take basic geology courses. Similarly, students in the Geology major who wanted to pursue the more quantitative aspects of Earth science found themselves without a sufficient background in physics. To solve these problems, faculty in the Physics and Geology departments worked together to create a Geophysics major that would provide students with strong backgrounds in both Geology and Physics and allow them to pursue employment or graduate study in geophysics.

Introduced in 2009, the Geophysics BS includes a rigorous background in math, and classical and mechanical physics. Students also take a core of geology classes that emphasizes the quantitative aspects of the discipline, including structural geology, and both theoretical and applied geophysics. These core classes may then be augmented with electives in both departments including Seismology, Planetary Geology, Mantle Dynamics, Electromagnetism, and Plate Tectonics.

The major has enjoyed steady growth since its inception. There are 22 students currently enrolled in the major and over a dozen have graduated with the Geophysics BS. Alumni have gone on to pursue graduate study at universities such as the University of Texas at Austin, and the University of Oklahoma, and they are working in both local and national industries.

Alumni News

Congratulations to Leah Courtland (2006) who just recently completed an NSF Postdoc at the Georgia Institute of Technology and joined the University of Indianapolis as an Assistant Professor of Earth Science.

Congratulations to Shawn Divitt (2009) who is due to defend his PhD thesis on April 4 at the Institute of Optics, University of Rochester. Degree conferral will be in May. His work focuses on optical spatial coherence.

Dan Gifford (2010) recently defended his PhD thesis in the department of Astronomy and Astrophysics at the University of Michigan. In that work, he developed and improved techniques for dynamically estimating the masses of galaxy clusters, some of the largest structures in our universe, and provided constraints on cosmological parameters that govern structure formation. He is now a Data Scientist at Getty Images in Seattle, WA which licenses high quality visual content to people and businesses all over the world.

Shortly after getting her Masters from Northern Arizona University, Christine Atkins (2010) got a job in Flagstaff at W. L. Gore & Associates (the company that makes Gore-Tex fabric) as a quality control engineer. She works in the Medical Products Division providing engineering support for an implantable, interventional stent graft.

Chaunee McKay (2011) graduated from the Master's Industrial Internship program at University of Oregon in 2013 and is now contracting at Microsoft as an optical hardware test engineer for the HoloLens.

Reuben Walker (2012) is currently a 2nd year doctoral student in the Jacobs School of music at Indiana University. From 2012-2015, Reuben worked as a research assistant in IU’s Department of Speech and Hearing Sciences, publishing an article in the Journal of Voice with Dr. Rita Patel and presenting at the 2015 Voice Foundation Symposium. Check out his busy performance schedule at www.reubenwalker.com.

Jake Wilcox (2015) is in the Master’s Industrial Partnership Program at the University of Oregon. He is currently completing an internship at Polaris Battery Labs.
Please Join Us:

Events in 2016

May: Back 2 Bellingham 2016 (May 13 - 15)  
WWU Scholars Week (May 16 - 20) www.wwu.edu/scholars/  
Physics Undergraduate Conference (May 19th)

June: The annual picnic! (please see our webpage for details)

Contact info:  
phone: (360)650-3818  
email: physics@wwu.edu

Colloquia

We generally schedule colloquia on Thursdays at 4pm. Please check our webpage for a schedule of upcoming talks and feel free to attend if you wish. Here is a sampling of talks in the last few months:

Dr. Armin Rahmani (Department of Physics and Astronomy, University of British Columbia) “Novel Phases of Interacting Majorana Fermions”

Dr. Ryan Wilson (US Naval Academy) “Building Quantum Matter with Light”

Dr. Natasha Holmes (Department of Physics, Stanford University) “Re-thinking intro Physics labs: Teaching and assessing critical thinking”

Dr. Suzanne Brahmia (Department of Physics and Astronomy, Rutgers) “Mathematization: Enhancing learning by fostering physics creativity”

Mix It Up: Science in Pop Culture!

On November 12th, 2015 the College of Science & Engineering (CSE) and 12 student clubs sponsored the third annual fall social on inclusion in STEM (Science, Technology, Engineering, and Mathematics).

Over 200 participants enjoyed science & pop culture trivia, mingling with other STEM majors, winning raffle prizes, learning more about the clubs in CSE and some (including the host) came dressed as their favorite fictional or historical scientist, engineer or mathematician. Guests also had an opportunity to hear a presentation and interact with a faculty panel.