

# MARSHALL PHYSICS

## MARSHALL PHYSICS NEWSLETTER # 2

April 2022

### HOWARD RICHARD LEFT MARSHALL



Dr. Howard Richard left Marshall University in December 2021 after 14 years of being a faculty in Physics Department.

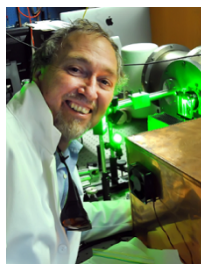
Howard Richards got his Ph. D at Florida State University in 1996. He has been doing his research in the area of Statistical-Mechanical Analysis and Simulations Calculation in Magnetism.

After serving at Texas A&M University-Commerce, Howard came to Marshall in 2007, starting a long journey with the Department. During the time at Marshall, many students of all science majors have had their Physics classes with Dr. Richards in their junior or sophomore years. Dr. Richards is a very devoted professor who always cares about his students. During his time at Marshall, Howard has been awarded the NSF REU grant "Computational Science Training for Undergraduates in Physics and the Mathematical Sciences" to train many undergraduates during 3 summers 2010-2012.

Howard involved in our Physics Weeks, High School Physics Day, Green and White Days and other events of the Department, always enthusiastically with creative and deep thoughts. 2019 Physics graduates will remember the online- graduation ceremony session he organized for them. Physics faculty will remember a sincere, humorous colleague who was always ready to give us a hand when we need it. Best wishes, Howard, for your next adventure.



### THOMAS WILSON'S RETIREMENT



Another faculty we will miss is Dr. Thomas Wilson, who will retire at the end of 2022 Spring semester.

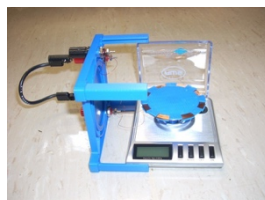
Thomas Wilson obtained his Ph. D at Indiana University in 1984 with his Thesis on "Dynamics of Nonequilibrium Broadband Phonon Distribution" under Professor Walter E. Bron. He came to Marshall in 1994.

At Marshall, Dr. Wilson has been doing an intensive, strong, world level research on Acoustic phonons. He spent one year as a Visiting Fellow at the CNRS/MPI High Magnetic Field Laboratory, Grenoble, France. Some of his important contributions are fabrication of superconducting bilayer microbolometer, published in *J. of Micro/Nanolithography, MEMS, and MOEMS* in 2015; and the discovery of an acoustic laser - based upon a nonlinear non-resonant four-wave acousto-optic interaction at 1.04 THz in a silicon superlattice, published as a *Rapid Communication in Physical Review B* in 2018. He was a principal Investigator on NSF, NASA, DoE, ARO and AFOSR phonon-related grants, totaling over \$2.5M. He was also a Co-Principal in WV HEPC Research Challenge Fund Award, "A Center for Energy Efficient Electronics at West Virginia University and Marshall University".



Physics major Steven Taylor with Professor Wilson engaged in small display recognition research for American Foundation for the Blind (Capstone)

Tom Wilson has been teaching different courses for Science students and Physics majors. Being very creative and always looking for implementing new technology, in 1995 Tom gave an online exam in Quantum Mechanics, what was the first online exam given at Marshall University as reviewed in Herald-Dispatch. He also created the first Physics departmental website.

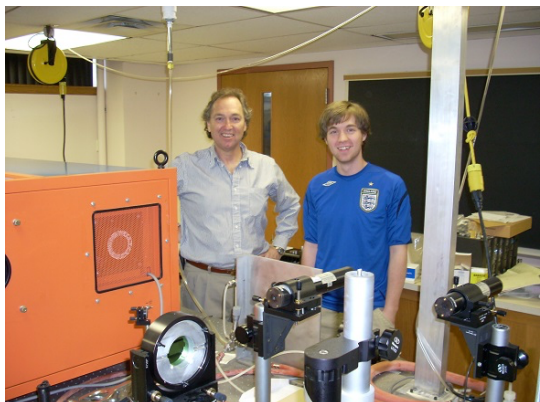


In 2018 while working on upgrading PHY 204 Labs, Tom created the 3D-printed miniature Kelvin Current Balance which was 2018 AAPT Apparatus Competition Winner





Tom was awarded 2003 Marshall University Hedrick Outstanding Faculty Award as well as Marshall Distinguished Artists and Scholars Awards in 2011, 2018, and 2019.



with physics major Daniel Crowder (Capstone on TEA CO<sub>2</sub> laser dynamics)

Tom, faculty and students will miss you as a researcher, teacher, colleague and friend. We wish you a Happy Retirement!



with Chemistry major, Sarah Barber and post-doc Konstantin Korolev.

## MARSHALL PHYSICS IN PANDEMIC

These 2 years we have been living, teaching, and studying in a special environment that we never had experienced before. This deadly virus, Covid, came and changed everything. Classes have to be taught virtually or online. We could not travel nor have any gathering, we have wear mask everywhere, we have to keep social distancing, we have to be in quarantine... Many and many new rules we have to follow, many new things we have to learn, and many problems we have to overcome. We feel lonely while have to stay home, teaching and learning all through computers; our family members, and ourselves, have been sick; and other problems the pandemic created for each and every one of us. But despite all the difficulties, we have tried our best to work and to learn. All faculty, staffs and students together, we gave our best to our students, we kept all classes successful and safe.



We will remember these days when we had to wear masks to all activities

## 2019 MARSHALL PHYSICS WEEK

2019 was the last time before the Pandemic the Physics Department organized its Annual Physics Week during the third week of October. The week was full of events. On Monday October 14<sup>th</sup>, all faculty, staffs and Physics majors got together to shoot at The Pool Hall, spending the meaningful time with each other.

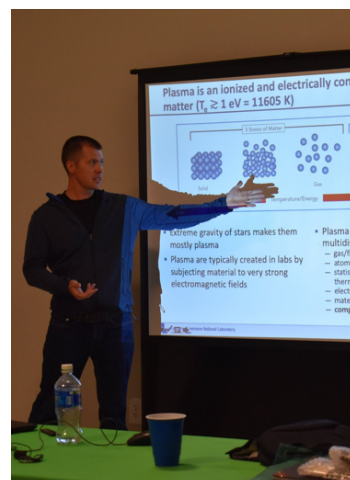


On Wednesday October 16 the Physics Research Orientation and BBQ has been held at the St. Cloud Commons. Our 2 alumni, Chad Michell, a Medical physicist, and Justin Angus, a scientist at Lawrence Livermore National Labs, gave talks.



Chad Michel obtained his B.S. degree in physics and math from Marshall in 1991 and went to graduate school at Ohio State University where he completed a PhD. Now he is working at James Cancer Hospital and Research Institute.

Justin Angus graduated from Marshall in 2007 and earned a PhD from the University of San Diego. Currently he is working on Numerical Simulations of Z-Pinch Plasmas at LLNL.



Faculty also gave talks on their research to show the students different research directions in the department.





The week ended with a "High School Physics Day" on Friday October 18 when we invited 400 high school students to come to enjoy Physics for the whole day, watching physics faculty showing physics demonstrations, exploring the cosmos from planetarium, tasting liquid nitrogen ice cream... We hope the day will be a good impression for our young scientists!



## FIRST MS PHYSICS THESIS DEFENSES

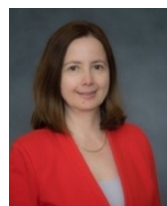
Our first 3 MS in Physics students, Dillon Buskirk, Ryan Vincent and David Facemyer, have defended their theses and graduated with their MS degree in December 2019. In the following year, in Spring 2021, Jacquelin Sizemore graduated. All our graduated students either are continuing their academic roads with prestigious Ph. D programs or went directly into work at great companies. Good start of our young program!



## FACULTY PUBLICATIONS & ACADEMIC ACHIEVEMENTS



Dr. Judy Fan's paper "*Flexible Dye-Sensitized Solar Cells Assisted with Lead-Free Perovskite Halide*", has been recently published in *Journal of Materials Research*. Judy has been awarded 2022 Air Force Research Lab Summer Faculty Fellowship at AFRL-Materials and Manufacturing for her proposal "*Sandwich Devices for Thermal Protection and Infrared Invisibility*" as well as 2022 John Marshall Scholar Summer Award 2022 for her proposal "*Thermal-Photo-Electronic Hybrid Device for Energy Harvesting*".



Dr. Maria Hamilton published "*Developing Tools for Multi-messenger Gravitational Wave Astronomy*," by World Scientific with Contribution to: MG15 (2019). From Fall 2019 to current, she gave 7 invited talks and research talks in national and regional conferences. Maria has been awarded "KITP Scholars program," sponsored by Kavli Institute for Theoretical Physics, as well as 2019 John Marshall Scholar Summer Award for her proposal "*Gravitational Waves from Binary Neutron Stars*".



Dr. Que Huong Nguyen has published 3 research papers: "*Ferromagnetism due to oxygen vacancies in low dimensional oxides*" in *Jour. Mag. Mag. Mat*; "*Strongly confined 2D parabolic quantum dot: Biexciton or Quadron*" in *Physica B: Condensed Matter* in 2021; and "*Charged excitons and trions in 2D parabolic quantum dots*" in *Physica B: Condensed Matter* in 2022. She has been awarded 2020 John Marshall Scholar Summer Award for her proposal "*Electronic Structure and Optical Response of Semiconductor and Polymer Structures*".



Dr. Tom Wilson is a winner of the 2018-19 MU Distinguished Artists & Scholars Award. He obtained the contract with the Institute of Physics for his prospective book "*The Acoustic Laser*".



Dr. Sean McBride's paper "*Azo dye functionalized polycarbonate membranes for textile dye and nitrate ion removal*" has just been accepted for publication in *Micromachines*. Dr. Sean McBride gave talks in 2021 Ohio-Region APS Meeting, and 2022 APS March Meeting.

## STUDENT ACHIEVEMENTS

Ellie White has been named one of 396 college students to receive a prestigious Goldwater Scholarship, becoming one of the 2 Marshall students who have ever earned this Scholarship. She has been awarded with “Outstanding Undergraduate” in 2 years 2019-2020 and 2020-2021. Jon Keaton, Jayden Leonard, Rae Stanley (2019-2020), Alec O’Dell, Peter Burbery (2020-2021), AJ Messinger, Powell Joseph and Jacob Lee (2021-2022) are awarded Academic Achievement Awards. In 2022, Alec O’Dell is awarded Outstanding Undergraduate Award. Selective students also have been awarded different Physics Scholarships.



## SIGMA PI SIGMA INDUCTION

Ryan Vincent, David Facemyer, Jayden Leonard, Dillon Buskirk (2019), Ellie White, Alec O’Dell, Jackie Sizemore (2021) and Aidan Payton (2022) have been inducted into the Sigma Pi Sigma National Honor Society.



## 2019 MEETING OF APPALACHIAN AMERICAN ASSOCIATION OF PHYSICS TEACHERS

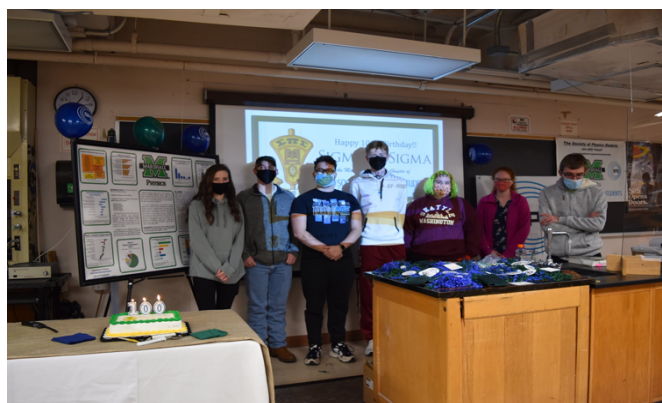


The meeting of Appalachian AAPT was held at Marshall on November 7-9, 2019 with talks presented by local educators from surrounding high schools and universities. For the 50th anniversary of the first moon landing, Dr. Don Thomas, former NASA astronaut, a veteran of four Space Shuttle missions, gave a talk titled “Overcoming Obstacles and Reaching for the Stars”. The meeting was organized by Dr. Hamilton with the help of Dr. McBride and SPS.

## NEW MS PROGRAM FOR PHYSICS TEACHERS

The Graduate Program of Physics Department just added to its curriculum the new MS of Physical Sciences for Physics Teachers degree. This master’s degree is targeted towards practicing secondary school teachers. The program consists entirely of asynchronous online courses, offering educators both the opportunity and the flexibility, adding to their teaching career a new educational skill. The program starts its first classes in Fall 2022.

## SOCIETY OF PHYSICS STUDENTS



From Summer 2019 to Spring 2021 Marshall University Chapter of the Society of Physics Students has been awarded Outstanding Chapter Award -the highest level of achievement and distinction given to SPS chapters across the nation. Dr. Sean McBride is the faculty advisor of Marshall University SPS.

## “FACES OF PHYSICS” SPEAKER SERIES

During the pandemic while all face-to-face conferences had been cancelled, Ellie White and SPS members had this wonderful idea to organize this speaker’s series. Starting from November 2020 each month a guest speaker talks about their research virtually on Youtube. The Faces of Physics Speaker Series is hosted and sponsored by Marshall University’s SPS and funded by the American Institute of Physics, NASA WV Space Grant Consortium. Great job, SPS members!

## GREEN AND WHITE DAYS/ HS WORKSHOPS

During the pandemic it was impossible to organize face-to-face recruiting events, but as soon as in-person Green and White Days came back, the Physics Department is active in meeting and having fun with high school students.

