Welcome to the Physics Department!

Dana Mohler Faria Science & Math Complex
Main Office: Room 220
Phone: 508-531-1386
All Physics Student Meeting Fall 2015

BRIDGEWATER STATE UNIVERSITY
# BSU Physics People

## Permanent
- Martina Arndt
- Patricia Benson
- Ed Deveney
- Joseph L. Hernandez
- Jamie S. Kern
- Thomas Kling
- James Munise
- Thayaparan Paramanathan
- Jeff Williams

## Visiting
- Robert V. Baldo
- Pradeep Bajracharya
- Joseph Doyle
- Anthony C. Houser
- Ronald F. Reynolds
- Susan Savill
- Valentin Voroshilov
- Steven R. Watchorn
General Information

http://www.bridgew.edu/node/1296

4 Faculty members

• Dr. Martina Arndt: Solar Physics, Astrophysics
• Dr. Ed Deveney: Experimental physics, Atomic and Molecular Physics
• Dr. Tom Kling: Cosmology and Relativity
• Dr. Jeff Williams: Teacher preparation
• Dr. Thaya Paramanathan: Bio-Physics

4 Staff Members

• Patty Benson: Administrative Assistant
• Dr. Joe Hernandez: Lab instructor
• Jamie Kern: Observatory Manager
• Jim Munise: Lab Technician

BRIDGEWATER STATE UNIVERSITY
Dr. Arndt has been Principal Investigator on multiple grants funded by the National Science Foundation (NSF). These funds have been used to cover travel to multiple eclipse sites (including Libya, China, Tatakoto, the Marshall Islands, Antigua, and South Africa), graduate and undergraduate course development, and undergraduate research. Her students have engaged in research projects ranging from solar physics (funded by NSF) to variable stars (funded by the Adrian Tinsley Program) to exoplanets (funded by NASA Space Grants).

Dr. Deveney developed the first physics research lab for undergraduates at Bridgewater State University constructing tunable diode lasers for studying fundamental quantum mechanical phenomena in atomic/molecular and optical (AOM) physics. He is a senior advisor for an NSF-funded research program at Yale probing fundamental atomic/nuclear and particle physics. Prior to coming to Bridgewater Dr. Deveney did post doc work with a 2000 US Fermi award winner at a National Lab including experiments at CERN. He has also been involved in medical physiology research at Tufts Vet School. Dr. Deveney emphasizes student mentoring covering theoretical quantum mechanics, experimental AMO physics, computer simulations and electronic

Dr. Thomas Kling is a theoretical physicist with interests in gravitational lensing, physics education, and student success in the STEM disciplines. Dr. Kling completed his undergraduate studies in physics with a minor in philosophy from Loyola University of New Orleans, and received his MS and PhD in physics from the University of Pittsburgh, where he studied classical general relativity under Dr. Ezra (Ted) Newman. Dr. Kling’s principle research studies how general relativity predicts light rays will be bent by gravity and the implications of this lensing for what we can learn about the universe. In 2013, he received 3.5 nights of telescope time at the Mayall 4-m telescope at Kitt Peak to observe star formation in galaxy clusters, a project on which he is collaborating with Dr. Ian Dell'Antonio from Brown University.

Dr. Jeff Williams enjoys teaching the introductory physics courses and has interest in the fields of energy and physics education. Dr. Williams works with pre- and in-service teachers in improving science teaching at the middle and high school levels. Dr. Williams is principal investigator for the National Science Foundation's Robert Noyce Scholarship Program. The Noyce Program is a 5-year, $1.45 million grant that provides scholarships and support to recruit talented science students to become K-12 teachers in high-need districts.

Dr. Paramanathan: Newswise — Being able to target the genetic code to develop an effective treatment of a disease is the ultimate goal for many scientists. Focusing on how the DNA interacts with a potential drug is an important element of DNA therapy research. Mark Williams, Ph.D., Associate Professor of Physics at Northeastern University's College of Arts and Sciences, and his research team have developed a method using optical tweezers to better understand how those interactions occur. This research, performed primarily by graduate student Thaya Paramanathan, published in a recent edition of the Journal of the American Chemical Society (vol. 130, p. 3752), has the potential to uncover crucial information about how to target DNA in order to develop therapies for chronic diseases such as cancer and AIDS.
BSU Physics Labs

A, M & O Laser Lab
Fundamental Atomic, Molecular & Optics (AMO) – QM studies – A MOT by 2015 – 2016?

Advanced/Modern Lab
Superconductivity, muons, speed of light, pNMR, Lock-ins, interferometers and more

Academic Machine Shop
Lathe, Mill, Table saw, wood, metals and more

Electronics/Robotics Lab
Analog, digital, microprocessors, power and DAQ

BioPhysics Laser Tweezers
Fundamental Biophysics of DNA, drug interactions, cancer and more – unique BSU tweezers by 2015 - 2017

Astro Lab
Theoretical Gravitational Lensing, Astrophysics and observational astronomy?
Observatory

The BSU Observatory hosts public and private viewing events, runs K-12 workshops, and provides academic resources for student research, astronomy courses, and service-learning.
Current Physics Student Stats

Majors: 46 – same as last year
Minors: 3 (was 5 last year)
First Time Freshman: 9 (last year 7)
Transfers: 4 – same as last year

Graduates (all of last year): 10 (was 8)
BSU Majors: Where are they now? About 1/3 each to grad school, Industry and Teaching.

Grad School Physics

- Louis Bianchini (’09) Brandeis, working toward Ph.D., works at CERN
- Tyler Holloway (’14), Northeastern University (Physics/BioPhysics)
- Marcus Gagliardi (’02): Ph.D. Idaho State University, Post-doc Researcher Idaho State Univ., Post-doc Fellow at University of New Mexico
- Brian Keith (’05): Clark University Physics, PhD (now teaching)
- Dale Smith (’11): University of Connecticut Physics – femto sec laser
- Brandon Green (’10): UMass Dartmouth Physics – ocean based clean energy
- Gary Forrester (’10): UMass Dartmouth Physics
- David Denny (’11): UMass Dartmouth Physics
- Katheryn St. Laurent (’12): UMass Dartmouth Physics
- Charles Harden: UMass Dartmouth Physics Gravitational lensing
- Phil Gee (’02). Math/Physics. University of Connecticut MS, Community College Math Prof.
- Petr Liska (’01) MS Univ. Of Connecticut
- Jay Tower (07’): UMass Boston
- Chris Cepero; intern Woods Hole, Kent State University Physics, right?
- Bryan Campbell got a MS (Physics) from UNH, and is teaching HS at Winthrop High School.
- Jay Tower (2013)r: UMass Boston MS
- Mark Berube (2013): UMass Boston MS
BSU Majors: Where are they now? About 1/3 each to grad school, Industry and Teaching.

Grad School

Grad School Engineering
- George Levesque ('05), Ph. D. University of Florida Mechanical Engineering ('09). Post-doc Univ. of Florida, Current Post-doc Lawrence Livermore National Labs?
- Scott Shelf ('10) (UMass, Engineering wind energy)
- Katie Sardina ('08) MS University of Rochester Mechanical Engineering, Materials

Grad School Medical Physics
- John Rossman ('09) UMass Lowell, Biomedical

Grad School Computer Science
- Brian McAllister ('10, CS) UPenn Robotics

Grad School MBA
- Cam Feldman ('07) MBA Boston Univ.
BSU Majors: Where are they now? About 1/3 each to grad school, Industry and Teaching.

**Industry**

**Optics:**

- Scott Johnson ('12) Plymouth Grating Lab Full Time
- Robert White ('07) Plymouth Grating Lab Full Time
- Dale Smith ('10) Plymouth Grating Lab (intern)
- Adam Manganiello ('12) Plymouth Grating Lab Full Time
- Amanda Hunter ('13) Plymouth Gratings Lab Full Time
- Mark Berube ('13) Plymouth Gratings Lab Intern – Full Time 2014
- Tyler Holloway (14) Plymouth gratings Lab Intern.
- Alex Mederos ('13) Plymouth Gratings Lab
- Kevin McElwee ('12) Angiodynamics Medical Applications Optics (intern/fulltime?): 2014 R&D Oncology Engineer
- Karen Kelleher ('05) BAE Systems, Inc. as an optical engineer
- Josh Lennon ('00) MIT Lincoln Labs Optical Engineering Group 2014
- Katie Sardina ('08) Applications Engineer Kidde-Fenwal, Inc.

**Other Industry:**

- Paul Ryan ('08)
- Erkan Gultur (09'), Applications Engineer Double E Company
BSU Majors: Where are they now? About 1/3 each to grad school, Industry and Teaching.

**Programming:**
- Scott Dallmeyer
- Alex Roche: 2013 Pearl, Meyer and Partners

**Teaching**
- Colin Gregory (13)
- Jay Tower (’07)
- Randall Bartsch (’05): Assabet Valley High School
- Bill Saggio (’02)
- Keith Stevens (’02)
- Petr Liska (’01): Douglas High School
- Amanda Bragan (09): teaching
- Bryan Campbell got a MS from UNH, and is teaching HS at Winthrop High School.
- Kayla Trimbly, Blackstone Valley Technical High School
Get Involved in your education and future!

Take Charge of you Path to Graduation and Beyond by going to my web site (search wiki Deveney)

• Know your program
• Know and plan your schedule
• Think outside of the classroom experiences (research, internships, volunteer, community)

Become a PAL or Tutor
• Prepare for after BSU (CV’s, GRE’s, applications)
Physics Fridays (outside of the classroom experiences)!

- Research (REU’s, ATP’s, NASA Space Grants, internships – on your own)!
- Society of Physics Students
- Research!
- Physics Speaker Series
- Research!
- Physics Student research Updates
- Research
- GRE prep sessions
Programs and Concentrations

Professional Physics (B.S.)
More math, extra electives in addition to the physics core, designed for those going into industry or graduate school

General Physics (B.A.)
Designed for those interested in a general physics degree, and for those going on to teaching. Fewer electives than the B.S.
Co-Curricular Opportunities

Research, Clubs, Internships, Study Away

• Physics and Astronomy Club
• Research Problems in Physics
• BSU Observatory (work study and non-work study)
• ATP
• Internships
• Work as a physics tutor
• STREAMS (PAL)
• Honors
How does advising works in the department?

For the first year, all transfer students are my advisees. After that year, we match you with someone who would be a good fit based on your future plans.
BSU Transfer Central! (Must see)

https://my.bridgew.edu/departments/TransferCentral/SitePages/Home.aspx

(* For example see B.E.A.R.S (Bridgewater Equivalency and Articulation Report System)
Recommended Courses for New and Transfer Students

SEE: https://deveney-bsu-physics.wikispaces.com/Dr.+D.+Home+Page

It all depends on your background!

Take a look at the Tentative Schedule of Physics courses through Fall 2016.
Overriding a Prerequisite

If you want to enroll in an upper-level course without having the exact prerequisite, you must complete the following form, allowing you to enroll in the course.

BRIDGEWATER STATE UNIVERSITY
Make sure you have the correct CRN numbers for registration

*noted in the yellow box on the sample registration form*