Department of Physics and Astronomy

Programs
Curriculum
Faculty
Facilities

Dave Robertson
GCAB Winter Meeting
December 4, 2009
Major Programs

• BS/BA in Physics
• BS in Physical Science with secondary teaching licensure
• 3/2 Cooperative Engineering
BA/BS in Physics

• Excellent training for graduate study, work in industry, teaching, business, law,…
• Solid grounding in basic science, mathematics, analytical thinking, problem solving
  – Minor in mathematics is automatic, and students regularly double major
BA/BS in Physics

• The physics component can be finished in three years
  – Students can start taking physics as sophomores, e.g., if they start less well prepared in math
  – Senior year can be focused on research
BA/BS in Physics

• Recent graduates have gone on to
  – Graduate study in physics, engineering and applied mathematics
  – Technical work in industry
  – Computer programming
  – Law school
  – Education
  – Business

• The job outlook is extremely good!
BS in Physical Science

• A mixture of physics and chemistry
• Students who complete the (separate) education component are licensed to teach both physics and chemistry at the secondary level
• On conversion to semesters (starting fall 2011) we will likely implement a pure physics licensure track
3/2 Cooperative Engineering

- Partner engineering schools:
  - Case Western Reserve University
  - Washington University in St. Louis

- Students spend three years at Otterbein, then two years at the partner school of their choice

- Receive BA in physics (occasionally BS) from Otterbein, and BS in engineering from the partner school
3/2 Cooperative Engineering

• Some advantages:
  – Liberally educated engineers
  – Small, focused introductory courses

• Not really a time disadvantage since very few students can finish an engineering degree in four years
3/2 Cooperative Engineering

• Decision to go can be made up to the beginning of the third year
  – Students sometimes decide to just finish a BS in physics and go to grad school in engineering
• Our students have done very well in these programs!
Curriculum

• Calculus-based introductory physics with laboratory (one year)
• Advanced courses in classical mechanics, electrodynamics, quantum mechanics, statistical mechanics
• Advanced and electronics laboratories
• Special topics courses: condensed matter physics, subatomic physics, general relativity, optics, mathematical methods, ...
• Research
Faculty

- Dave Robertson (Ph.D. UCSB, 1990)
- Brian Sell (Ph.D. UC Davis, 2007)
- Nathaniel Tagg (Ph.D. Guelph, 2001)
- Uwe Trittmann (Ph.D. Heidelberg, 1996)
Research Opportunities

• Theoretical and computational physics (Robertson, Trittmann)
  – Light-cone field theory, supersymmetry, hadronic physics
• Surface properties of layered magnetic materials (Sell)
  – Experiments carried out at the Lawrence Berkeley National Laboratory
• Neutrino physics (Tagg)
  – Experiments carried out at the Fermi National Accelerator Laboratory
  – MINOS and MINERvA collaborations
Research Opportunities

• Faculty are supported by grants from
  – National Science Foundation
  – Research Corporation
  – Ohio Supercomputer Center

• Research students have recently traveled to
  – Berkeley
  – CERN (in Geneva, Switzerland)
  – UC Davis
  – Indiana University
Brandi McVety at CERN

Justin Young and Prof. Brian Sell at LBL
Facilities

• New building opened in March 2009
• State-of-the-art classrooms and teaching laboratories
• Student/faculty research spaces
• Machine shop
• Observatory
Cardinal Science Scholars Program

• Scholarship program for talented physics, engineering and chemistry students
• Supported by large (~ $500k) grant from NSF
• Minimum requirements include at least two of the following:
  – 24 composite ACT
  – 3.0 HS GPA
  – Ranked in upper quartile of HS class
• Consideration is automatic
Cardinal Science Scholars Program

• Includes enhanced academic, social, and career programming:
  – Weekend summer immersion experience
  – Involvement in a year-long mentoring triad
  – Social activities with students and faculty
  – Visits to regional graduate programs and industries
  – Talks by leading scientists

• Deadline for consideration: March 1
Interested students should...

• Ask questions
• Visit
• Take lots of math!

http://www.otterbein.edu/physics
drobertson@otterbein.edu