

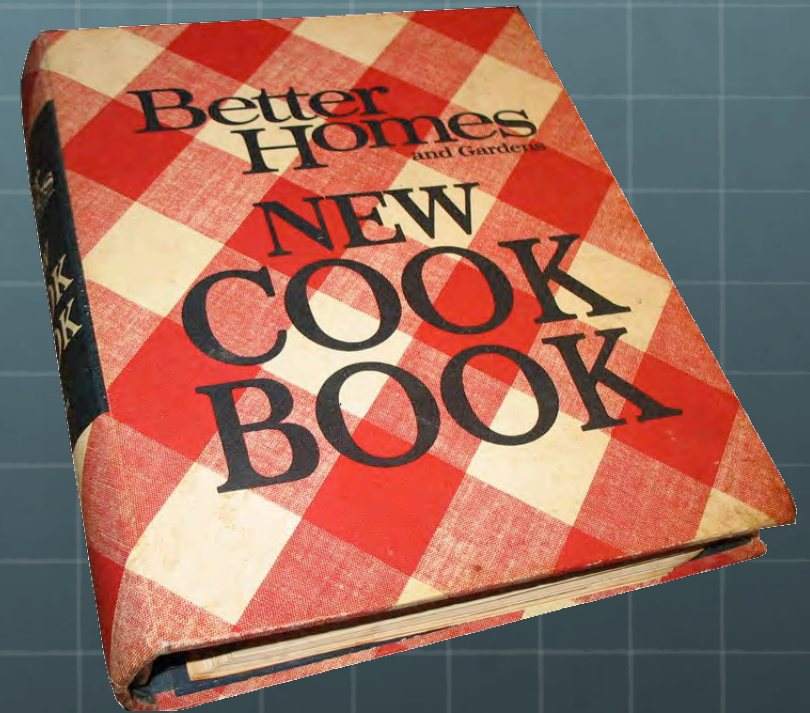


# Riding the MOOC Tsunami

Wolfgang Bauer, Gary Westfall  
Michigan State University

# Learning to Cook

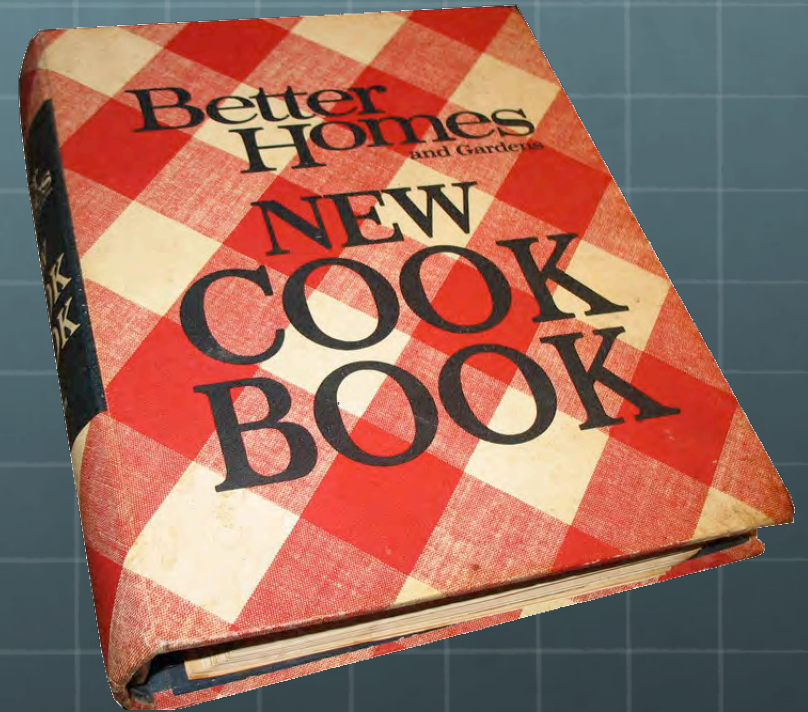
- Method 1: buy a cookbook and follow instructions





# Learning to Cook

- Method 1: buy a cookbook and follow instructions



- Method 1(a):  
(really still method 1, but with more modern delivery technology)

# Learning to Cook

Method 2: take an internship with a famous cook

- Immersive
- One-on-one attention
- Immediate feedback
- Rigorous quality control

**BUT:**

- Very expensive
- Can only be done for a few

## Cooking Schools

*Fire Up Your Culinary Skills*



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### Le Cordon Bleu

Food has a way of speaking to you, and inspiring you to be creative. And your creations bring smiles of delight to the faces of all who try them. So turn your creative talents into a career. Le Cordon Bleu's specialized training can get you started on your journey to learn the way to a culinary career.

Our programs in culinary arts, pâtisserie and baking, and hospitality and restaurant management offer you opportunities to:

- Train hands on alongside professional chef instructors in industry-equipped kitchens where you'll use commercial -grade tools of the trade and fine ingredients.
- Develop well-rounded experience, as you practice your skills serving patrons in on-campus, student-run restaurants.
- Move on to perfecting your skills and developing your creative style in your externship working alongside culinary professionals.



# Learning to Cook

- Method 3:
  - Select presentations from best chefs in the world
  - Detailed instructions from many sources
  - Send in your finished dishes for taste-tests
  - Receive feedback (email, text, ... from assistants of chefs)
  - Repeat
  - Final exam (for credit): perform in front of judges



# Learning to Cook

## Method 3 (cont.): provide a learning community

Exchange of ideas between learners

Create more than what teachers designed initially

ICTmagic - Food & Cookery

http://ictmagic.wikispaces.com/Food+%26+Cookery

guest | Join | Help | Sign In

## ICTmagic

Wiki Home  
Pages and Files  
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Search Wiki

Winner Best educational wiki 2011 Edublog Awards

Featured on the Wikispaces blog

### Food & Cookery

+1 0

Facebook Twitter StumbleUpon Email RSS 2

<a href="http://www.foodily.com/">http://www.foodily.com/</a>	his is such a lovely recipe site. Search for recipes across the Net. Displayed consistently, clearly and simply.
<a href="http://cookite2bn.org/">http://cookite2bn.org/</a>	A lovely child-friendly cookery site with recipes, resources and activities.
<a href="http://www.foodafactoflife.org.uk/Index.aspx">http://www.foodafactoflife.org.uk/Index.aspx</a>	A great food tech site designed for children from the British Nutrition Foundation with recipe sheets and videos.
<a href="http://punchfork.com/">http://punchfork.com/</a>	A lovely, clear site to find yummy recipes for your cookery

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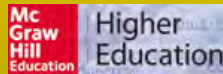
# Higher Education

## University

Faculty

Students

Textbook  
Publishers



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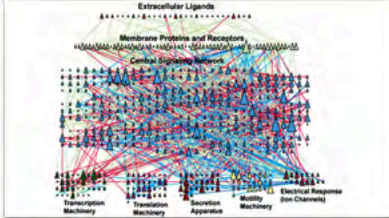
Vanderbilt University »

### STARTING SOON (39)


[View courses starting soon »](#)




**Introduction to Public Speaking**  
University of Washington, Jun 24th




**Introduction to Systems Biology**  
Icahn School of Medicine at Mount Sinai, Jun 3rd




**English Common Law: Structure and Principles**  
University of London International Programmes, Jun 13



**Cryptography I**  
Stanford University, Jun 17th



**Sustainability of Food Systems: A Global Life Cycle Perspective**  
University of Minnesota, Jun 14th



**Latin American Culture**  
Tecnológico de Monterrey, Jun 3rd





Partners | Coursera

https://www.coursera.org/partners

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### Global Partners U.S. State Institutions

American Museum of Natural History <b>NEW</b>	Northwestern University	University of California, San Francisco
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California Institute of Technology	Relay Graduate School of Education <b>NEW</b>	University of Copenhagen
California Institute of the Arts	Rice University	University of Florida
Case Western Reserve University	Rutgers University	University of Geneva
Columbia University	Sapienza University of Rome	University of Illinois at Urbana-Champaign
Commonwealth Education Trust <b>NEW</b>	Stanford University	University of London International Program
Curtis Institute of Music	Technical University of Denmark (DTU)	University of Maryland, College Park
Duke University	Technische Universität München (TUM)	University of Melbourne
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École Polytechnique Fédérale de Lausanne	The Chinese University of Hong Kong	University of Minnesota
Emory University	The Hong Kong University of Science and Technology	University of Pennsylvania
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Georgia Institute of Technology	The Ohio State University	University of Rochester
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Johns Hopkins University	The University of Tokyo	University of Wisconsin-Madison
Ludwig-Maximilians-Universität München	Universidad Nacional Autónoma de México	Vanderbilt University
Match Teacher Residency <b>NEW</b>	Universitat Autònoma de Barcelona	Wesleyan University
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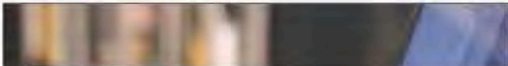


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### NEWS & ANNOUNCEMENTS

# What is the business model?

-  Remedial education for the general population
-  Educational foreign aid
-  Branding
-  Everybody else does it; so we need to do it , too ...



# Monetizing MOOCs

- Use MOOC materials in a flipped classroom, and have TAs for student interaction => need (almost) no faculty
- Allow students, who took MOOCs, to complete assignments and take exams, but charge reduced tuition => need (almost) no universities

**M~~OO~~OC**

**(Massive ~~Open~~ Online Course)**

**New title of this talk:**

**MOC-ing the MOOCs**



## Technology

May 6, 2013

[f](#) [t](#) [g+](#) [e](#) [p](#) Comments (2)

### Faculty Backlash Grows Against Online Partnerships



Staff Photo, Justin Ide, Harvard News Office

Michael Sandel, a Harvard professor, taught an online course that San Jose State U. asked its philosophy professors to use in place of their own instruction. They said no.

*By Steve Kolowich*

Many professors recognize that online education is changing the landscape of academe. But faculty members at several colleges are making it clear that they will not be steamrolled.



#### Most Popular

Most Viewed

Most Commented

1. The Document: an Open Letter From San Jose State U.'s Philosophy Department
2. Prominent Scholar Was Banned From Rutgers Campus
3. Why Professors at San Jose State Won't Use a Harvard Professor's MOOC
4. New Graduates Have Unrealistic Expectations for Pay, Survey Finds
5. Self-Sabotage in the Academic Career

#### Campus Viewpoint

# MSU Physics Virtual University

- 1993 NSF-ILI grant (k\$45+45) to improve lab/lecture sequence in LBS (Bauer, Benenson, Westfall)
- 1995 MultiMedia Physics CD
- 1997 *lectureOnline* (Kortemeyer)
- 1997 Virtual University courses PHY231c, PHY232c (27 students)
- 1998 cliXX Physik CD (Germany)
- 1998 HHMI grant (M\$1.8, McGroarty)
- 1999 Advanced Placement Physics
- 2000 MSU-deal with Apex Learning
- 2000 NSF-ITR grant (M\$2.1) for LON-CAPA (Kortemeyer, Bauer, Kashy<sup>2</sup>, Speier)
- 2008 Complete redo of all VU course offerings with Camtasia
- 2012 Current annual enrollment ~1,200/year (total > 10,000)
- 2013 Astronomy VU



# MSU Virtual University Physics

- Semi-synchronous work with regular weekly homework assignments and fixed exam dates
- Proctored exams for student > 30 miles from campus
- Same exams, homework, clicker questions for VU students as for lecture-based classes
- Faculty interaction via email, chat-rooms, physical help room

# Assignments

- LON-CAPA
- Individualized
- Highly customizable
- Numerical
- Conceptual
- Dynamic graphs
- Math input

LON-CAPA Potential field

http://educog.com/res/msu/physicslib/msuphysicslib/54\_ElecPotential1/msuprob04.problem?sym...

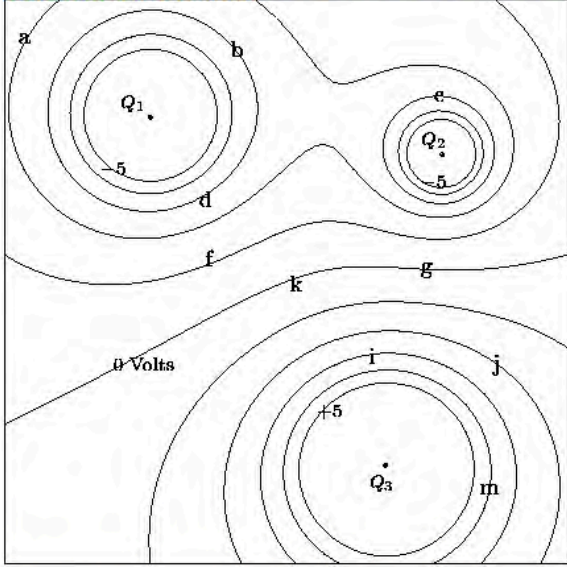
Wolfgang Bauer (Course Coordinator) PHY 184B Summer 2011 New Messages Roles Help Logout

Main Menu | Course Contents | Course Editor | Groups | Switch course role to...

Course Contents » ... » HW #3 (06/09) » Potential field

Functions Modify user grades for this assessment resource Modify parameter settings for this resource

The lines show the equipotential contours in the plane of three point charges,  $Q_1$ ,  $Q_2$ , and  $Q_3$ . The values of the potentials are in kV as indicated for the +5, 0, and -5 kV contours. The positions of the charges are indicated by the dots.



cm 1 2 3 4 5

The letters are on the equipotential contours.

- ☐ Charge  $Q_3$  has the largest magnitude of all.
- ☐ The electric field at i is stronger than at j.
- ☐ The force on a proton at g points to the bottom of the page.
- ☐ Charge  $Q_2$  is the largest negative charge.
- ☐ The electric field at k is zero.
- ☐  $Q_1$  is a negative charge.

Submit Answer Tries 0/20

Calculate the work required to move a charge of  $-0.35 \times 10^{-12} \text{ C}$  from i to b.

Submit Answer Tries 0/20

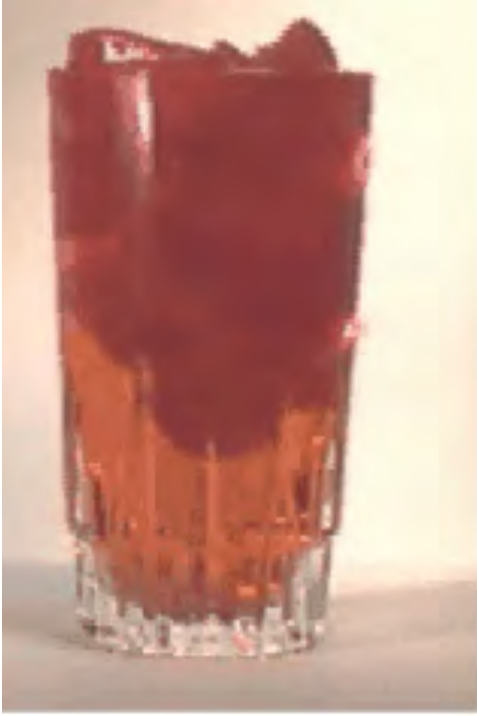


# Lecture Demonstration Videos

- Recorded all intro lecture demonstrations
- Instructor can include each into VU lectures



# Lecture Demonstrations Videos



Time-lapse



Real-time

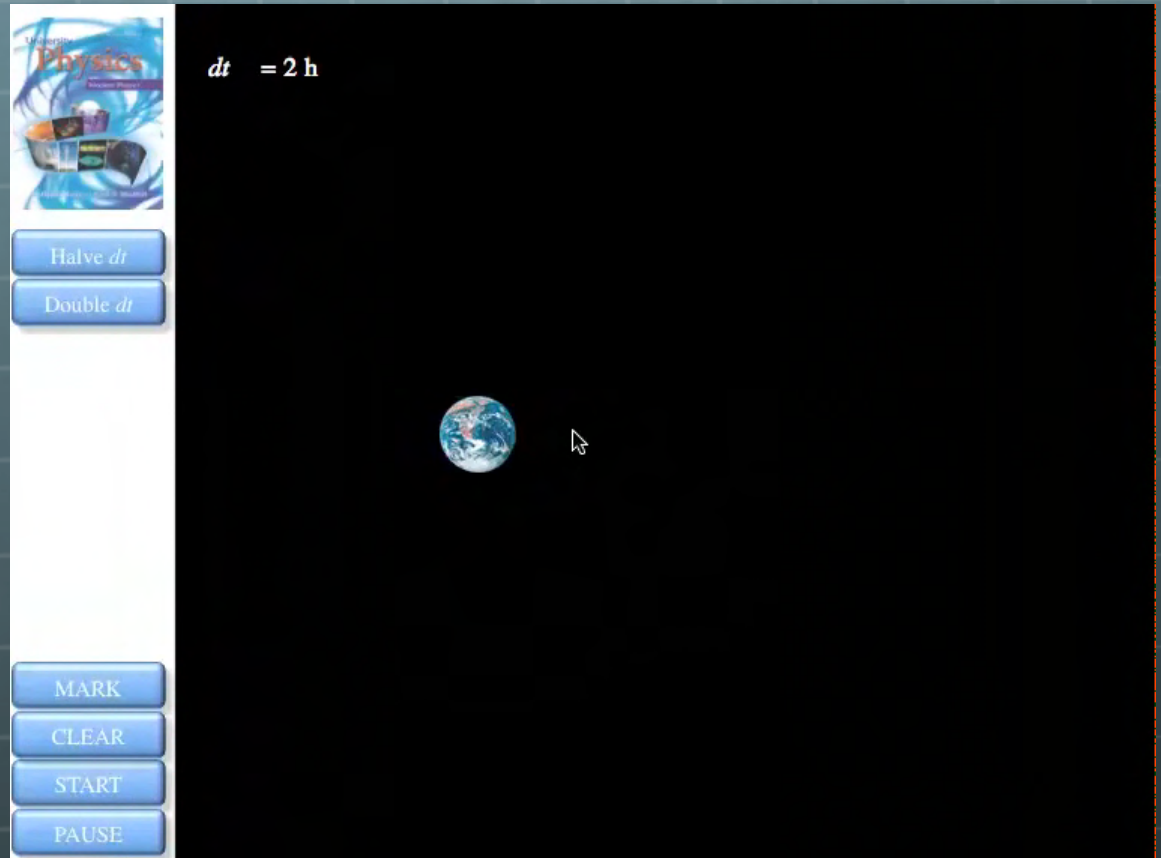


Slow-motion



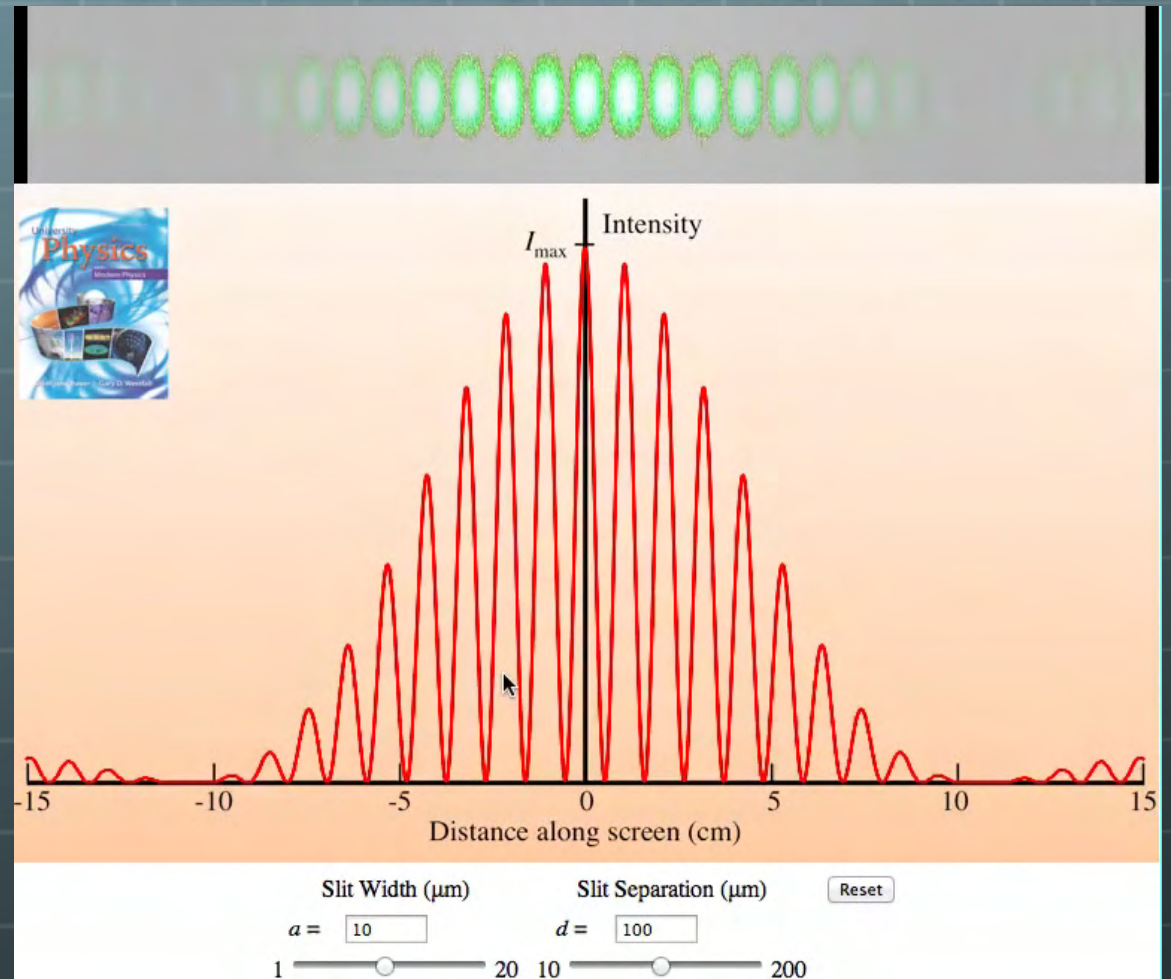
# Interactive Exercises

- First: java-based
- Now: html5
- Can be embedded into LON-CAPA & CourseWeaver (and thus tested!)



# Interactive Exercises

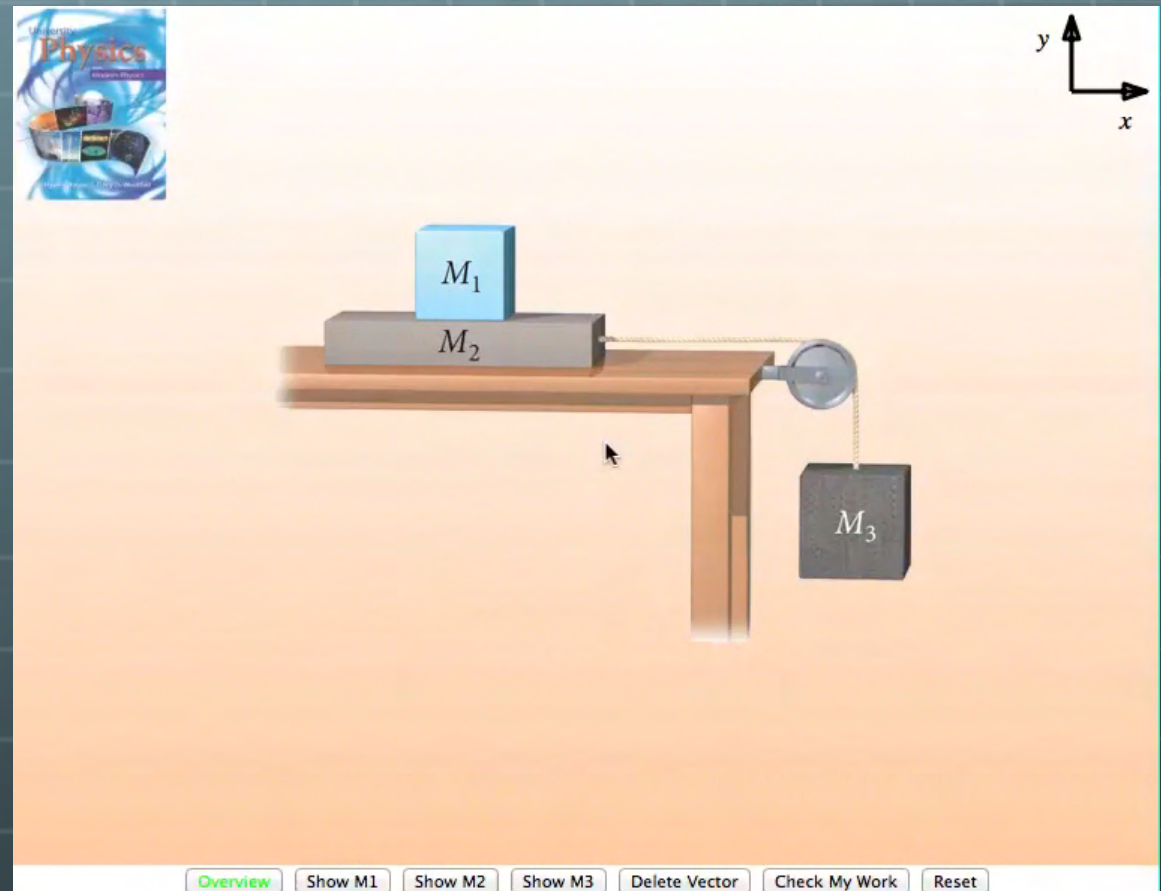
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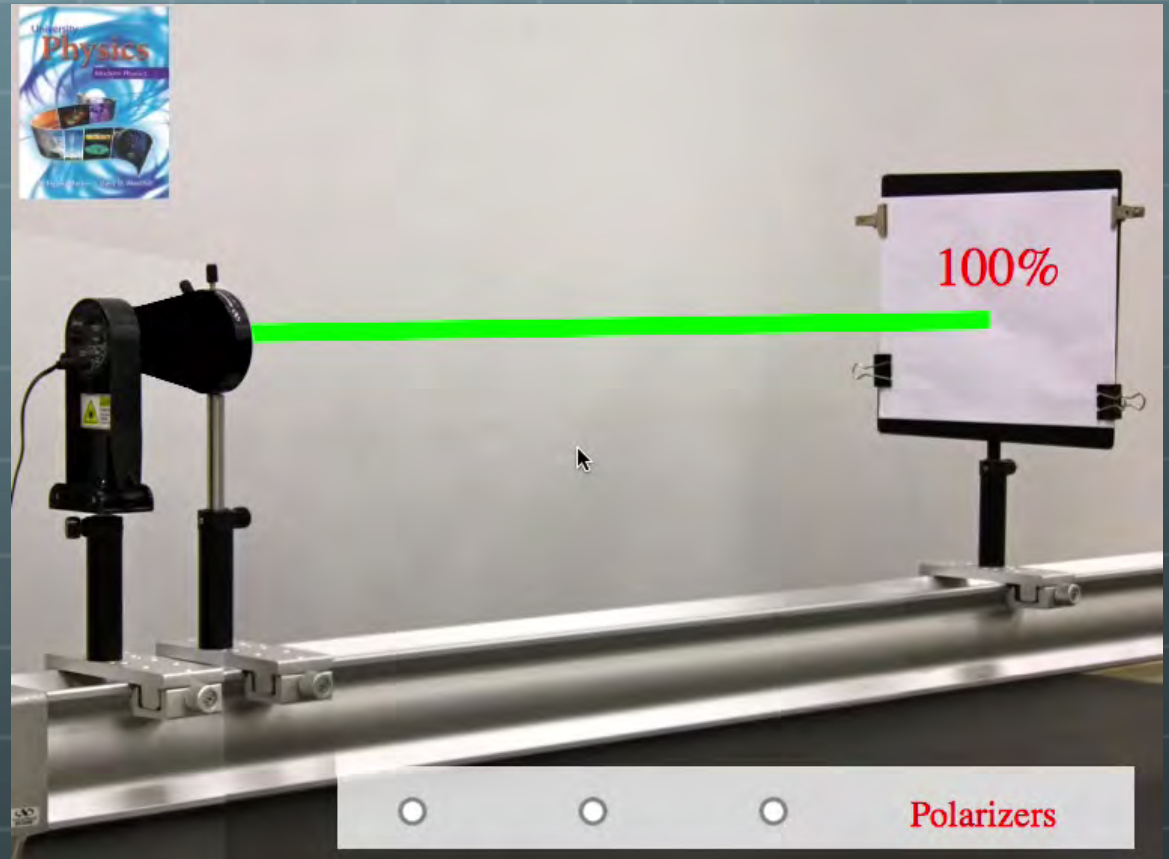
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# Interactive Exercises

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More samples at <http://www.pa.msu.edu/~bauer/m.html>

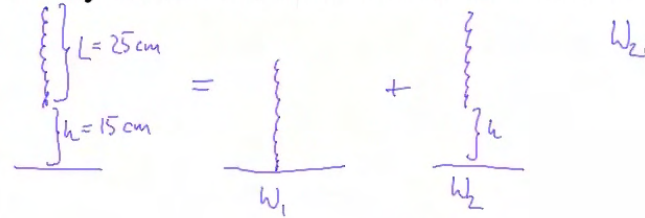
Complete set at Bauer & Westfall, University Physics (E-book, McGraw-Hill 2014)



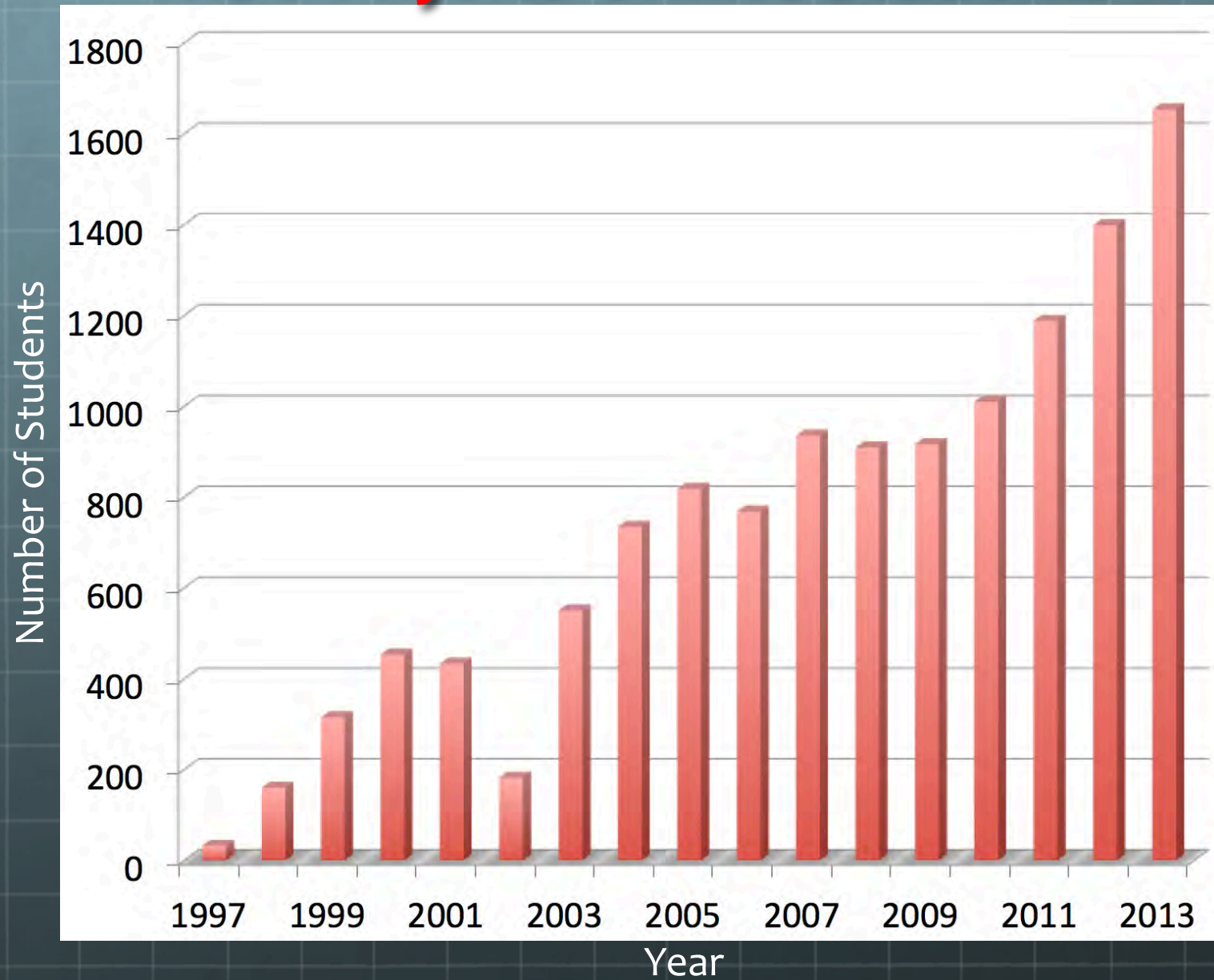
# Lectures

- 5-7 minute segments
- Camtasia screen captures with voice-over
- No talking head
- Try to capture experience of student coming to office hour and getting one-on-one help

A chain of length 0.25 m has a mass of 150 g and rests on a table. How much work is required to pick this chain up by one of its ends and lift it up slowly so that the other end of the chain is 15 cm above the table?



# MSU Physics Online Students



# Big Data

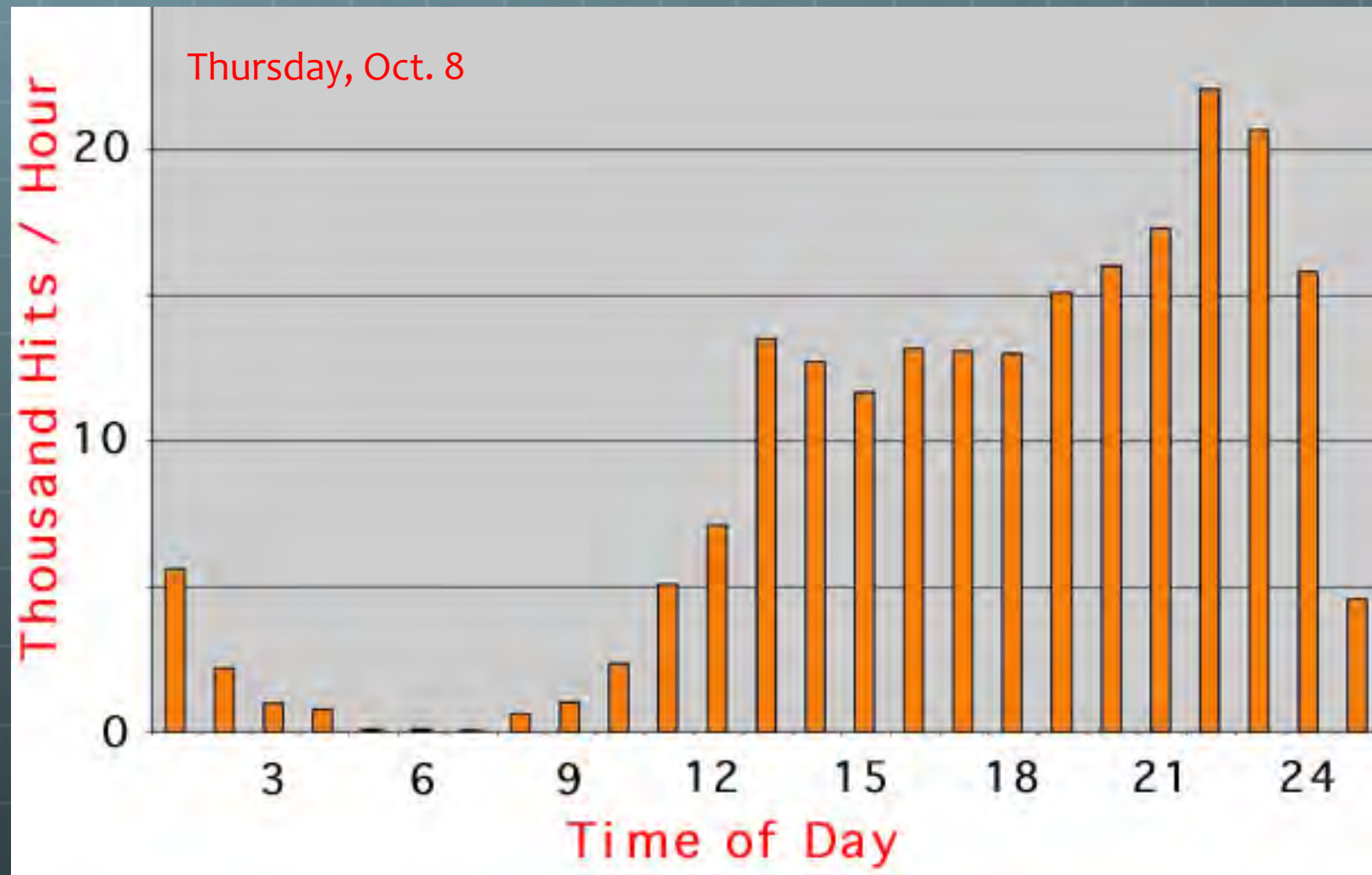
- 🌐 Thousands of students

- 🌐 Millions of clicks



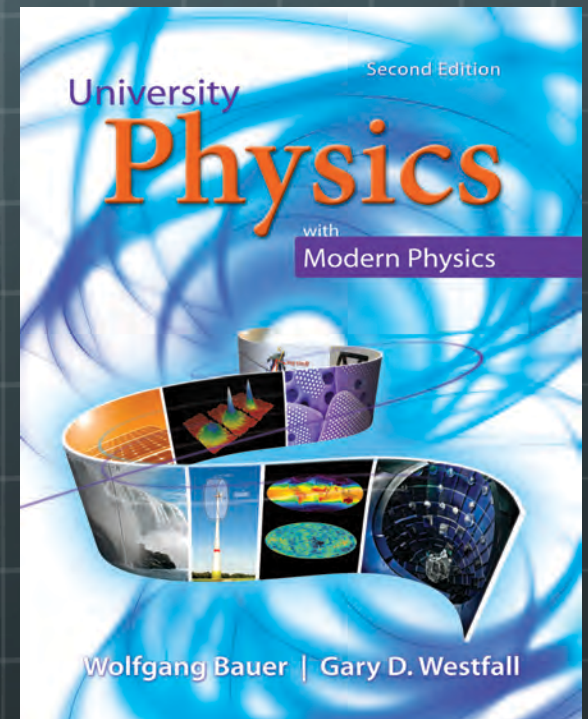
# When do Students Work?

- Homework due at midnight
- 770 students in class




# Build your own

- LON-CAPA & CourseWeaver contain  $\sim 10^5$  individual resources that can be freely accessed and assembled
- Some fraction of high-quality content is owned by authors/publishers and can only be accessed by adopting textbook
- Course management system itself is open source freeware
- Hosting solutions are available (for a fee)





# Future Work: MAMOOOCs



## Multi-author MOOCs

-  Shareable database of multimedia resources
-  Every instructor can take advantage of every author's work

## Multi-author multimedia e-books

-  Micro-royalties for individual objects
-  Educational object economy

## Adaptive individualized learning environments for students of all abilities

-  Select favorite authors
-  System adapts to student needs and past preferences



## ● Main Collaborators

- Gary Westfall
- Gerd Kortemeyer
- > 10,000 MSU undergraduates
- > 100 universities

## ● Contact

- [bauer@pa.msu.edu](mailto:bauer@pa.msu.edu)
- <http://www.pa.msu.edu/~bauer/>
- @BauerWestfall
- <http://www.courseweaver.com>
- <http://www.lon-capa.org>

## ● Funding

- NSF
- HHMI
- McGraw-Hill
- Michigan State U
- A.v.Humboldt

