

Interactive Physics Textbooks

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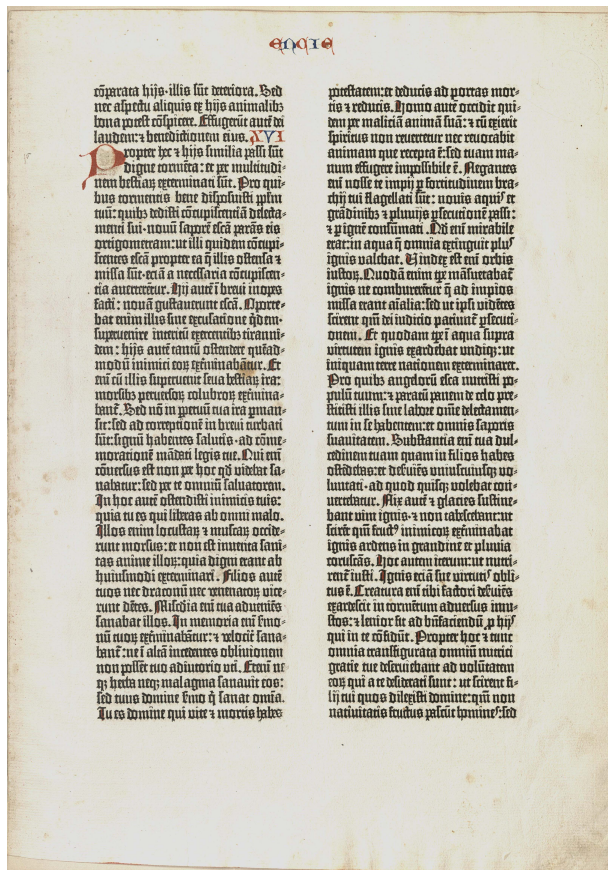
Wolfgang Christian

Davidson College

Interactive Teaching for 20+ Years

- Group Problem Solving (Heller, et. al. 1992)
- Physics by Inquiry (McDermott, et. al. 1996).
- Peer Instruction (Mazur 1997).
- Lecture Demonstrations (Sokoloff 1997).
- Just in Time Teaching (Novak, et. al. 1999)
- Socratic Dialog.
- Flipped Classroom.
- Etc. Your favorite method.

But What about Books?



Gutenberg 1439

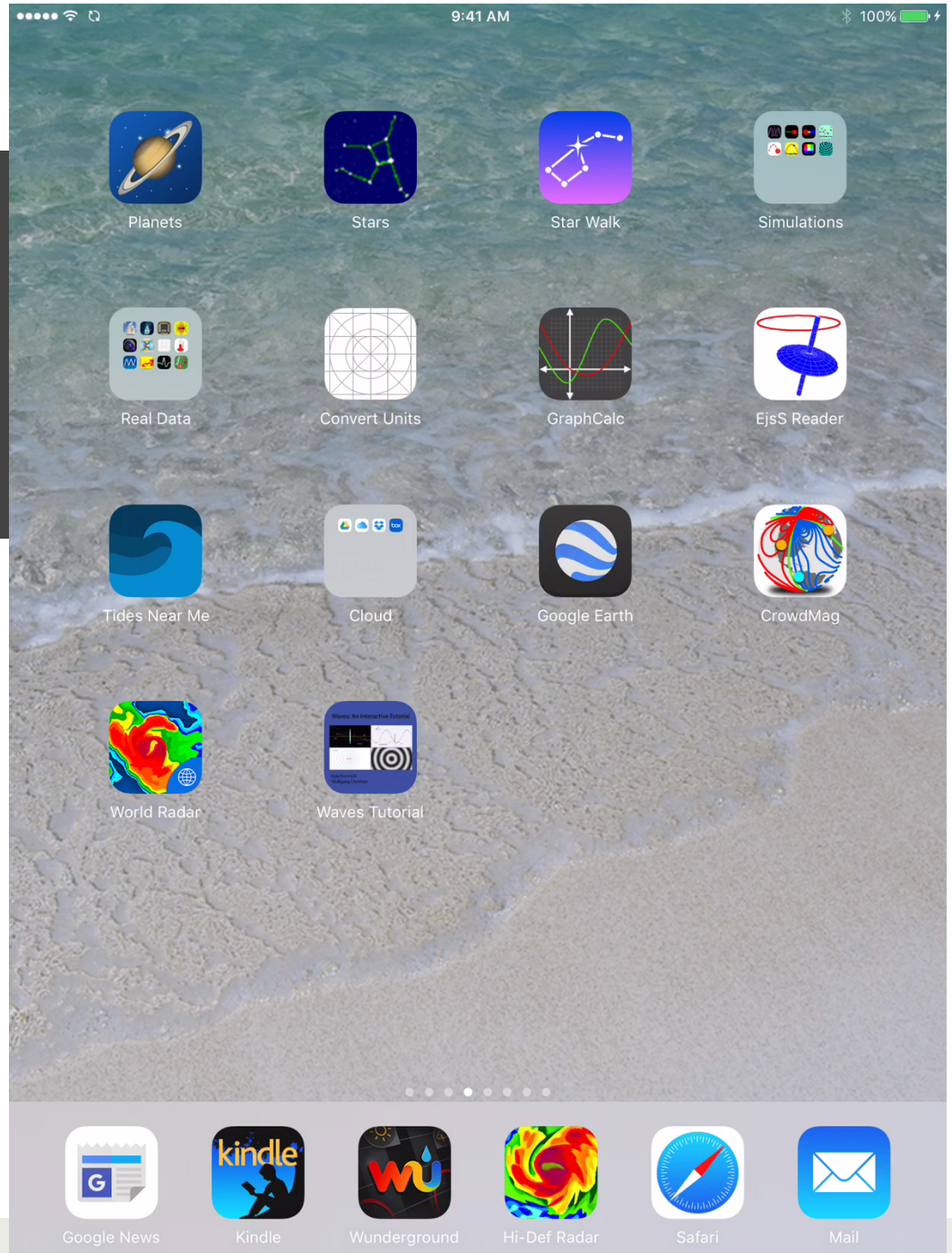


JEAN GUTTENBERG

Interactive Books?

- ❑ Free PDF ([OpenStax](#)). Customized PDF ([FlatWorld](#)).
- ❑ Free WORD ([Jeff Schnick: Calculus Based Physics](#)).
- ❑ Wiki ([PrettyGoodPhysics](#)).
- ❑ Hypertext ([HyperPhysics](#) -Georgia State).
- ❑ Kinetic Books ([Perfection Learning](#)).

Wave Tutorial on iTunes 2016



Now also Available for Free!

- On AAPT-ComPADRE in English
- On AAPT-ComPADRE en Español

Ondas: Tutorial Interactivo by Kyle Forinash and Wolfgang Christian

Hosted by
AAPT ComPADRE



1. Propiedades básicas

2. La combinación de las ondas

3. Interacciones externas

4. Aplicaciones

Ondas: Tutorial Interactivo

Este libro en línea utiliza una serie de tutoriales basados en simulaciones interactivas y animaciones para explorar la física de las ondas. Los estudiantes desarrollan su comprensión de las ondas a través de preguntas y ejercicios guiados sobre la base de estas simulaciones.

- [1. Propiedades básicas](#)
- [2. La combinación de las ondas](#)
- [3. Interacciones externas](#)
- [4. Aplicaciones](#)

[About this book](#)



Este libro en línea utiliza una serie de tutoriales basados en simulaciones interactivas y animaciones para explorar la física de las ondas. Los estudiantes desarrollan su comprensión de las ondas guiados a través de cuestiones y ejercicios basados en las simulaciones.

Sound

iTunes Preview

Overview

Music

Video

Charts

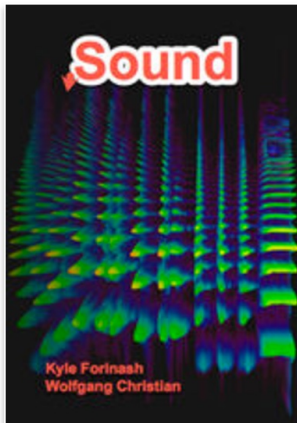
Sound

An Interactive Tutorial

Kyle Forinash

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iPod touch, and Mac.

Category: Physics

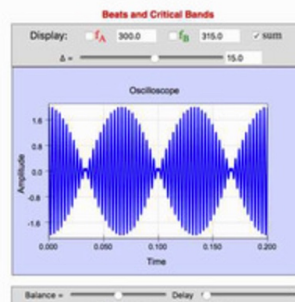
Published: Jan 11, 2017

Publisher: Open Source Physics

Description

Sound is an interactive textbook that contains 33 interactive simulations which require the reader to click buttons, move sliders, etc. in order to answer questions about the behavior of waves and sound in particular. There are also links to videos and other online resources that pertain to the topics being covered as well as suggestions for laboratory exercises and sound clips for understanding the fascinating subject of sound and music. The goal is to create an engaging text that integrates the strengths of printed, static textbooks and the interactive dynamics possible with simulations to engage the student in actively learning the physics of sound.

Screenshots



the frequency corresponding to note shown on the key. The buttons at the top allow you to select the tunings of four different temperaments; clicking a different temperament will change the frequency of the notes between C and C an octave higher to match the chosen temperament. The notes are not perfectly mechanical because they are pure sine waves with no overtones and so lack timbre. The scale button plays the notes on the scale and the 5th button plays a perfect fifth; C and F for this scale. Clicking on the overtone check adds the first harmonic at half the volume of the fundamental and the harmonic with a volume one third the fundamental to any note being played. The overtones are louder than would be normal for a stringed instrument in order to better demonstrate beating and dissonance in the different combinations (Go back to chapter 10 to review beats and dissonance if you have forgotten). Three chords used in popular music can also be played: C Major chord plays the notes C, E and G; the D major chord plays the notes D, F# (F sharp) and A; the G major chord plays the notes G, B, and D.

Temperaments Simulation



1. Physics of Vibrations

2. Waves

3. Sound and Perception

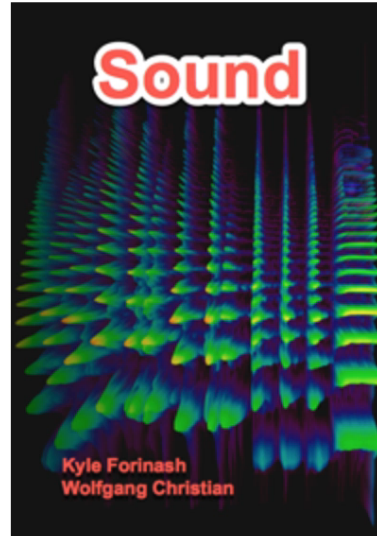
4. Electromagnetism and...

Sound: An Interactive eBook

This book consists of 33 interactive simulations which require the reader to click buttons, move sliders, etc. in order to answer questions about the behavior of waves and sound in particular. There are also dozens of links to YouTube videos and other online resources that pertain to the topics being covered as well as suggestions for laboratory exercises and sound clips for understanding the fascinating subject of sound and music. The goal was to create an engaging text that integrates the strengths of printed, static textbooks and the interactive dynamics possible with simulations to engage the student in actively learning the physics of sound.

- [1. Physics of Vibrations](#)
- [2. Waves](#)
- [3. Sound and Perception](#)
- [4. Electromagnetism and Sound Reproduction](#)

[About this book](#)



This online book uses a series of tutorials based on interactive simulations and animations to explore the physics of sound. Students develop their understanding of waves through guided questions and exercises based on these simulations.

An EPub edition is also available in the Apple iTunes store: ISBN-13: 978-0-9905805-5-3.

Introduction to Sound

The physics of sound lends itself particularly well to examples, demonstrations and student participation in experiments. There are thousands of YouTube videos of interesting sound phenomena and dozens of simulations related to the physics of sound and music. This book was created from trying to provide access to these resources in a single source, first from a web page, then as interactive simulations on web pages and finally as this interactive textbook.

[ready-to-run](#) - [details](#)

Was this Hard to Do?

- YES! But not as hard as you think!
- Easy Java/JavaScript Simulations by Francisco Esquembre:

www.um.es/fem/EjsWiki/

Make Books Interactive!



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