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Quantum Chemistry 6 - Quantum Chemistry 6 by Andrew McKinley 554 views 4 years ago 7 minutes, 23 seconds - Table of Contents: 00:17 - Vibrational quanta 00:59 - The **Quantum**, harmonic oscillator 01:29 - The **Quantum**, harmonic oscillator ...

Vibrational quanta

The Quantum harmonic oscillator

The Quantum harmonic oscillator

Revisiting the Schrödinger equation

Vibrational wavefunctions

Vibrational probabilities

Application to Diatomics

Quantum Mechanics: Schrödinger's discovery of the shape of atoms - Quantum Mechanics:

Schrödinger's discovery of the shape of atoms by Eddington Jones 1,017,925 views 10 years ago 7 minutes, 18 seconds - General theme I think it could be useful if I restate the central message of the video here, for clarity: The shape of hydrogen (and ...

At.I talk about the planetary model of the atom. There were actually two variations of the planetary model, the Rutherford model and the Bohr model. It was the Bohr model that made these 'very nice predictions' I mention, it gave a relation for the energy levels of hydrogen. It couldn't explain where these energy levels were coming from though, it took Schrödinger's discovery of the total hydrogen wave function to explain their origin.

At.I simplify the discovery of wave-particle duality in electrons a bit. De Broglie was indeed the first to propose it for electrons, but he was building on previous work by Einstein. Einstein had made a formal definition of wave-particle duality in photons (light), and De Broglie was extending it to matter.

At.I draw eight orbitals of hydrogen as an example, but there are more. Strictly speaking there's an infinite amount of orbitals, of which about the first 80 are important for chemistry and physics. I picked these eight to draw simply because they make nice examples of which shapes hydrogen can take. The spotty picture I draw at.of the thousand positions of the electron is somewhat simplified. I draw every position inside the three blobs -- but this is not quite correct. The blobs are what are known

as "90%-probability surfaces". Basically, you have a 90% chance of finding the electron within these blobs. The remaining 10% of sightings will fall somewhat outside the blobs. Like any wave, the electron wave function decays slowly and stretches out for quite a while. I didn't want to draw these extra 10%, because I thought it would be confusing.

At.I refer to the electron's wave function as 'probability wave function'. This is a slip of the tongue on my part, the phrase is either 'probability distribution' or 'wave function'.

The '40 years of heated debate' I mention at.was about the interpretation of quantum mechanics, and the philosophical implications. Things like teleportation, determinism and statistical randomness were discussed, leading to several different interpretations, the main ones of which were: The Copenhagen interpretation, the Many Worlds interpretation and Realism.

What is The Schrödinger Equation, Exactly? - What is The Schrödinger Equation, Exactly? by Up and Atom 1,490,373 views 5 years ago 9 minutes, 28 seconds - Hi! I'm Jade. Subscribe to Up and Atom for new physics, math and computer science videos every two weeks! *SUBSCRIBE TO ...

The Long Version

The Wave Function

Energy Is Actually Proportional to Frequency

What Would some Typical Schrodinger Solutions Look like

Solutions to the Schrodinger Equation

Quantum Mechanics - Part 1: Crash Course Physics #43 - Quantum Mechanics - Part 1: Crash Course Physics #43 by CrashCourse 2,010,245 views 7 years ago 8 minutes, 45 seconds - What is light? That is something that has plagued scientists for centuries. It behaves like a wave... and a particle... what? Is it both?

Intro

Ultraviolet Catastrophe

Plancks Law

Photoelectric Effect

Work Function

Summary

How to learn Quantum Mechanics on your own (a self-study guide) - How to learn Quantum Mechanics on your own (a self-study guide) by Looking Glass Universe 1,693,084 views 4 years ago 9 minutes, 47 seconds - This video gives you a some tips for learning **quantum**, mechanics by yourself, for cheap, even if you don't have a lot of math ...

Intro

Textbooks

Tips

The First Quantum Field Theory - The First Quantum Field Theory by PBS Space Time 1,533,434 views 6 years ago 15 minutes - Quantum, mechanics is perhaps the most unintuitive theory ever devised. And yet it's also the most successful, in terms of sheer ...

Quantum Mechanical Model - Quantum Mechanical Model by Bozeman Science 490,011 views 10 years ago 4 minutes, 36 seconds - 007 - **Quantum**, Mechanical Model In this video Paul Andersen explains how the **quantum**, mechanical model of the atom refined ...

Intro

Shell Model

Coulombs Law

Orbitals

Quantum Numbers

Summary

Schrödinger equation for hydrogen - Schrödinger equation for hydrogen by MIT OpenCourseWare 126,707 views 6 years ago 20 minutes - MIT 8.04 **Quantum**, Physics I, Spring 2016 View the complete course: <http://ocw.mit.edu/8-04S16> Instructor: Barton Zwiebach ...

Bound States

Radial Equation

Effective Potential

The Differential Equation

Quantum Mechanics and the Schrödinger Equation - Quantum Mechanics and the Schrödinger Equation by Professor Dave Explains 1,140,754 views 6 years ago 6 minutes, 28 seconds - Okay, it's time to dig into **quantum**, mechanics! Don't worry, we won't get into the math just yet, for now we just want to understand ...

an electron is a

the energy of the electron is quantized

Newton's Second Law

Schrödinger Equation

Double-Slit Experiment

PROFESSOR DAVE EXPLAINS

Orbitals, the Basics: Atomic Orbital Tutorial — probability, shapes, energy |Crash Chemistry Academy

- Orbitals, the Basics: Atomic Orbital Tutorial — probability, shapes, energy |Crash Chemistry

Academy by Crash Chemistry Academy 1,728,533 views 12 years ago 14 minutes, 28 seconds -

A crash course tutorial on atomic orbitals, **quantum**, numbers and electron configurations + practice problems explained.

define it with the three axes

take a look at the shapes of orbitals

hold a maximum of two electrons

designate each individual orbital by the axis

fill each orbital with the total of two electrons

start to fill the 2's orbital

review the s orbital is spherical

Physical chemistry - Physical chemistry by Academic Lesson 335,720 views 3 years ago 11 hours,

59 minutes - Physical chemistry, is the study of macroscopic, and particulate phenomena in chemical systems in terms of the principles, ...

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Edition: Chapter 2 - Ex. 2.16, Pg. 32 by Vyshnavi Vennelakanti 32 views 2 years ago 14 minutes, 2

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advanced ...

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Chemistry - Correct Approach towards Quantum Chemistry | A Beginner's Guide | How to Study

Quantum Chemistry by All 'Bout Chemistry 17,811 views 3 years ago 14 minutes, 41 seconds -

This is a beginner's guide on how to start studying **Quantum Chemistry**,. what should be correct

approach on it and what are the ...

Understand Quantum Mechanics

Quantum Chemistry for Beginners

How To Start Studying Continuously

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6 minutes, 50 seconds - uBookedMe.com's Side-by-Side Comparison of **Chemical**, Principles 6ed

International **Edition**, vs. Principals of **Chemistry**, by ...

Introduction to Quantum Chemistry - Introduction to Quantum Chemistry by Simons Institute 5,759

views Streamed 4 years ago 1 hour - Bryan O'Gorman (UC Berkeley/NASA Ames) [https://si-](https://simons.berkeley.edu/talks/tbd-116)

mons.berkeley.edu/talks/tbd-116 The **Quantum**, Wave in Computing Boot ...

Intro

Model

Electronic structure problem

Example: state of 2 electrons

Example: state of $n = 2$ electrons, $N = 4$ orbitals

Creation and annihilation operators (cont.)

Hamiltonian in Occupation basis

Hartree Fock
Configuration interaction
Selective methods
Quantum chemistry on a quantum computer
Fermion-qubit mappings: Jordan-Wigner
Variational quantum eigensolver
Quantum Phase Estimation
Adiabatic State Preparation
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CS1 maint: unfit URL (link) Levine, Ira. N (1978). "Physical Chemistry" University of Brooklyn: McGraw-Hill Levine, Ira. N. (1978), p12 gives the original... 152 KB (19,115 words) - 14:15, 2 March 2024
on chemistry. Harper & Bros. p. 46. draper, john william. Levine, Ira. N (1978). "Physical Chemistry" University of Brooklyn: McGraw-Hill Levine, Ira. N... 270 KB (31,768 words) - 20:34, 6 November 2023
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Robert Parr (A.B. 1942) – Professor Emeritus of Chemistry, UNC Chapel Hill; co-founder of quantum chemistry Ainissa Ramirez (Sc.B. 1990) – material scientist... 304 KB (30,316 words) - 23:38, 7 March 2024