



# Quantum Systems under Gravitational Time Dilation (Springer Theses)

By Magdalena Zych

Download now

Read Online 

**Quantum Systems under Gravitational Time Dilation (Springer Theses)** By Magdalena Zych

This thesis introduces a new theoretical tool to explore the notion of time and temporal order in quantum mechanics: the relativistic quantum "clock" framework. It proposes novel thought experiments showing that proper time can display quantum features, e.g. when a "clock" runs different proper times in superposition. The resulting new physical effects can be tested in near-future laboratory experiments (with atoms, molecules and photons as "clocks"). The notion of time holds the key to the regime where quantum theory and general relativity overlap, which has not been directly tested yet and remains largely unexplored by the theory. The framework also applies to scenarios in which causal relations between events become non-classical and which were previously considered impossible to address without refuting quantum theory. The relativistic quantum "clock" framework offers new insights into the foundations of quantum theory and general relativity.

 [Download Quantum Systems under Gravitational Time Dilation ...pdf](#)

 [Read Online Quantum Systems under Gravitational Time Dilatio ...pdf](#)

# Quantum Systems under Gravitational Time Dilation (Springer Theses)

*By Magdalena Zych*

## Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych

This thesis introduces a new theoretical tool to explore the notion of time and temporal order in quantum mechanics: the relativistic quantum "clock" framework. It proposes novel thought experiments showing that proper time can display quantum features, e.g. when a "clock" runs different proper times in superposition. The resulting new physical effects can be tested in near-future laboratory experiments (with atoms, molecules and photons as "clocks"). The notion of time holds the key to the regime where quantum theory and general relativity overlap, which has not been directly tested yet and remains largely unexplored by the theory. The framework also applies to scenarios in which causal relations between events become non-classical and which were previously considered impossible to address without refuting quantum theory. The relativistic quantum "clock" framework offers new insights into the foundations of quantum theory and general relativity.

## Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych Bibliography

- Rank: #5705701 in Books
- Published on: 2017-02-09
- Original language: English
- Number of items: 1
- Dimensions: 9.25" h x .44" w x 6.10" l,
- Binding: Hardcover
- 139 pages

 [Download Quantum Systems under Gravitational Time Dilation ...pdf](#)

 [Read Online Quantum Systems under Gravitational Time Dilatio ...pdf](#)

## **Download and Read Free Online Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych**

---

### **Editorial Review**

From the Back Cover

This thesis introduces a new theoretical tool to explore the notion of time and temporal order in quantum mechanics: the relativistic quantum "clock" framework. It proposes novel thought experiments showing that proper time can display quantum features, e.g. when a "clock" runs different proper times in superposition. The resulting new physical effects can be tested in near-future laboratory experiments (with atoms, molecules and photons as "clocks"). The notion of time holds the key to the regime where quantum theory and general relativity overlap, which has not been directly tested yet and remains largely unexplored by the theory. The framework also applies to scenarios in which causal relations between events become non-classical and which were previously considered impossible to address without refuting quantum theory. The relativistic quantum "clock" framework offers new insights into the foundations of quantum theory and general relativity.

About the Author

After graduating in Physics from the University of Łódź, Poland, Magdalena Zych joined the group of Masahito Yukawa in Vienna -- first as an Erwin Schrödinger Junior Research Fellow, and then as a PhD student.

Inspired by discussions with Vienna's frequent guests: Danny Greenberger ("G" of the GHZ) and Oxford philosopher Harvey Brown, she quickly shifted her research interest from entanglement in relativistic quantum fields to joint foundations of quantum theory and general relativity. Currently, she continues to pursue this fascinating research line in sunny Brisbane (Australia) as a Fellow of the University of Queensland.

### **Users Review**

**From reader reviews:**

**Kevin Caputo:**

Now a day those who Living in the era everywhere everything reachable by interact with the internet and the resources inside can be true or not need people to be aware of each details they get. How a lot more to be smart in acquiring any information nowadays? Of course the answer then is reading a book. Studying a book can help persons out of this uncertainty Information mainly this Quantum Systems under Gravitational Time Dilation (Springer Theses) book as this book offers you rich facts and knowledge. Of course the information in this book hundred per cent guarantees there is no doubt in it you probably know this.

**Maria Hughes:**

This book untitled Quantum Systems under Gravitational Time Dilation (Springer Theses) to be one of several books that will best seller in this year, that's because when you read this publication you can get a lot of benefit upon it. You will easily to buy this book in the book retailer or you can order it by means of online. The publisher of the book sells the e-book too. It makes you more readily to read this book, since you can read this book in your Smart phone. So there is no reason for your requirements to past this guide from your list.

**Katherine Velasquez:**

Are you kind of hectic person, only have 10 or maybe 15 minute in your time to upgrading your mind ability or thinking skill actually analytical thinking? Then you are receiving problem with the book as compared to can satisfy your short period of time to read it because pretty much everything time you only find guide that need more time to be go through. Quantum Systems under Gravitational Time Dilation (Springer Theses) can be your answer mainly because it can be read by you actually who have those short spare time problems.

**Andrew Gillon:**

Many people spending their time by playing outside having friends, fun activity along with family or just watching TV all day long. You can have new activity to invest your whole day by reading a book. Ugh, do you think reading a book can definitely hard because you have to use the book everywhere? It alright you can have the e-book, taking everywhere you want in your Smart phone. Like Quantum Systems under Gravitational Time Dilation (Springer Theses) which is finding the e-book version. So , try out this book? Let's notice.

**Download and Read Online Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych**

**#467UAR2JZW1**

## **Read Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych for online ebook**

Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych Free PDF download, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych books to read online.

### **Online Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych ebook PDF download**

### **Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych Doc**

Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych Mobipocket

Quantum Systems under Gravitational Time Dilation (Springer Theses) By Magdalena Zych EPub