



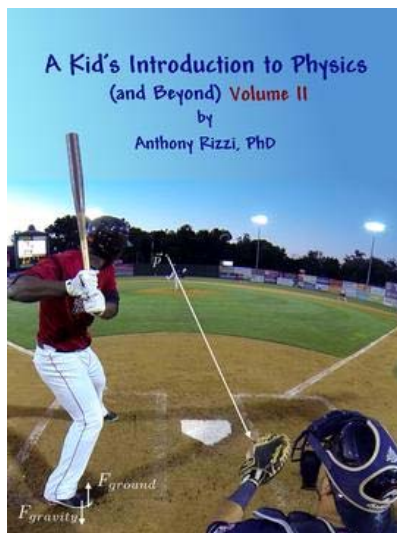
THE INSTITUTE FOR ADVANCED PHYSICS

The Institute News

- **A Kid's Introduction to Physics (and Beyond) Vol. 2** **New Release**
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- Kid's book on radio and at convention booth
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- *The Glory of God is a Man Fully Alive* by Anthony Rizzi

New Release

A Kid's Introduction to Physics (and Beyond) Volume 2



"This book [KIP Vol. 2] is chock-full of profound truths! The reader will discover wonderful truths about the various forces acting in our amazing universe and be inspired to meditate on the order found among them. Readers will learn the answers to fundamental questions that are not even being asked anywhere else, making this book a must read for teachers and students alike. All students need to know the basic physics contained in this series; without it, they cannot truly understand the modern world in which we live or the ideas that are forging our future."

Anthony DiCarlo, teacher, 10 years experience in public schools, Teacher of the Year awardee

Physicist Dr. Anthony Rizzi has just written a sequel to *A Kid's Introduction to Physics (and Beyond)* that continues on the lessons learned showing the simple connection between physics, our everyday world and God. These two volumes are an *essential* supplement to your student's or child's science curriculum for 6th grade and up. They show why science (which includes modern science) inevitably leads to God, and how everything we learn about the

physical world tells us something new about God. Without these books, children are left with no grounded big-picture view of our world and our place in it. Science can seem relatively unimportant, whereas it is of primary importance.

What is new in Volume 2?

Having learned about the physical world at the most general level in the first volume, this 2nd volume introduces young people to the next

level of physics. It starts with their natural wonder about the things around them. It builds on their common sense, making it clear and precise, and leads them to taste the advanced method of modern science. In answering the question of how and why a baseball flies from your hand when you throw it, it introduces mechanics, electricity and magnetism and quantum mechanics at a very simple level. The student will even learn how to make a motor. And, he will learn more about the nature of the Unchangeable Changer, without Whom there is nothing. The book is extremely important, as physics is the base science upon which all of our thinking

builds, including our knowledge of Him.

Who should read this book?

The book is appropriate for children as young as sixth grade but is targeted for seventh and eighth grade. Kids in higher grades and even adults need and will enjoy it. This book answers the oft heard questions “Why do I need to learn physics?” and “Why do I need to learn math?” in a direct and charming way.

How do I purchase the book?

The book (6x8, 107 pages, 14 font, soft cover) may be purchased for \$28 plus s/h on the IAP web site at:

<http://www.iapweb.org/store/kids>

Christendom College Seminar

Our Modern Problem: We Have Too Much Faith



Dr. Gregory Townsend, Vice-President of Academic Affairs at Christendom College, invited **Dr. Anthony Rizzi** to present a seminar via Skype to Christendom College students and faculty. The Discussion and talk centered on the nature of our world and the problem it faces. It can be encapsulated as *Our Modern Problem: We Have Too Much “faith” not enough Reason*. During the seminar on March 26, 2019, Dr. Rizzi, in a question and answer style, brought out how little we know about the basic things around us and how little we know about our own modern understanding of reality, the good and the bad. He pointed out the need for everyone to properly learn the ground of all our thinking, physics, i.e. those things that come to us through the senses. The seminar was not just a talk, but an invitation to grow in truth starting from the things we know first through our senses. It was well received by faculty and students alike!

LSU Political Science Lecture

Course: Aristotle and Aquinas: On Nature and Justice

In this honors course, **Dr. James Stoner**, LSU Department of Political Science, focuses on Aristotle and Aquinas, concentrating on their moral and political works, but paying attention as well to their treatment of physics, metaphysics, and what has come to be known as epistemology. A main textbook for the course is *The Science Before Science: A Guide to Thinking in the 21st Century* by IAP Director **Dr. Anthony Rizzi**. On April 22nd, Dr. Rizzi was an invited lecturer for the course at the end of which he fielded many questions from the very interested students. Several students not in Dr. Stoner’s class heard about the lecture and wished to come and received permission to do so.




A New Quantum Paradox and its Resolution

LSU Physics Seminar

Theoretical Physics Seminar
TUESDAY, APRIL 9
3:30 p.m. | 435 Nicholson Hall

A New Quantum Paradox and its Resolution



The Aharonov Bohm Effect has been called one of the seven wonders of the quantum world, as it seems to defy classical thinking by causing electrons to change trajectory outside of a solenoid where there is no B-field! Recently, Lev Vaidman has given very credible arguments that the AB effect arises from the interaction of the electron with the particles constituting the current in the solenoid. Anthony Rizzi and Philip Pearle have verified Vaidman's prediction with a fully quantum mechanical calculation. Still, this left a serious puzzle. A straight forward calculation shows that there are now two phase shifts, one caused by the Vaidman effect and one caused by the standard mechanism, giving a total of twice the standard AB shift! This result contradicts the measured value of the AB effect. More thought on the system threatens a third addition to the phase shift. The detective work of Rizzi and Pearle led them to do a quantum mechanical treatment that included all elements of the system and to the solution to this dilemma, giving for the first time a complete quantum mechanical treatment of the AB effect.

Dr. Anthony Rizzi
Director
Institute for Advanced Physics

LSU
Department of Physics & Astronomy

The Aharonov Bohm Effect has been called one of the seven wonders of the quantum world, as it seems to defy classical thinking by causing electrons to change trajectory outside of a solenoid where there is no

B-field. Recently, **Lev Vaidman**, Tel Aviv University, has given very credible arguments that the AB effect arises from the interaction of the electron with the particles constituting the current in the solenoid. **Anthony Rizzi**, Institute for Advanced Physics, and **Philip**

Pearle, Hamilton College, have verified Vaidman's prediction with a fully quantum mechanical calculation. Still, this left a serious puzzle. A straight forward calculation now shows that there are two phase shifts, one caused by the Vaidman effect and one caused by the standard mechanism, giving a total of twice the AB shift! This result contradicts the measured value of the AB effect. More thought on the system threatens a third addition to the phase shift. The detective work of Rizzi and Pearle led them to do a quantum mechanical treatment that included all elements of the system and to the solution to this dilemma, giving for the first time a complete quantum mechanical treatment of the AB effect. LSU physics professor **Juhan Frank** invited Rizzi to present his findings at a seminar on April 9th.

PBR article published in *Foundation of Physics*

Dr. Anthony Rizzi's paper, *Does the PBR Theorem Rule out a Statistical Understanding of QM?*, was published in *Foundation of Physics* in November 2018. This is an important paper that clarifies our understanding of quantum mechanics in light of an important Theorem by M. Pusey, J. Barrett, and T. Rudolph. The paper defends against a common, but implicit, understanding of quantum mechanics that has deeply confused our understanding of all of reality. The paper's abstract is:

The PBR theorem gives insight into how quantum mechanics describes a physical system. This paper explores PBRs' general result and shows that it does not disallow the ensemble interpretation of quantum mechanics and maintains, as it must, the fundamentally statistical character of quantum

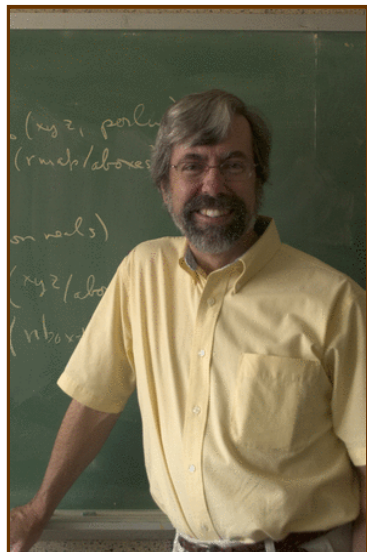
mechanics. This is illustrated by drawing an analogy with an ideal gas. An ensemble interpretation of the Schrödinger cat experiment that does not violate the PBR conclusion is also given. The ramifications, limits, and weaknesses of the PBR assumptions, especially in light of lessons learned from Bell's theorem, are elucidated. It is shown that, if valid, PBRs' conclusion specifies what type of ensemble interpretation is possible. The PBR conclusion requires a more direct correspondence between the quantum state (e.g., $|\psi\rangle$) and the reality it describes than might otherwise be expected. A simple terminology is introduced to clarify this greater correspondence.

Read Dr. Rizzi's article at:

<https://arxiv.org/abs/1811.01107>

Found. Phys. 48 No. 12, pp 1770-1793, 2018

Murray Daw celebrates 10 years teaching PFR



Physics for Realists is a landmark series that uses our common sense to discover and clarify modern physical theory. The resulting pedagogical approach makes physics more accessible and its beauty more evident. This series will revolutionize our understanding of physics and the way it is taught.

Murray Daw

As the fall semester came to a close in December 2018, **Dr. Murray Daw**, R.A. Bowen Professor of Physics, Department of Physics & Astronomy at **Clemson University**, celebrated his tenth year teaching *Physics for Realists* to physics majors. Daw teaches *PFR* Mechanics (this text is also celebrating its 10 year anniversary), *PFR* Electricity and Magnetism, and most recently *Physics for Realists Quantum Mechanics*. Dr. Daw is an IAP faculty member involved in teaching and research. Dr. Daw teaches *Physics for Realists* to college students and at physics colloquiums, including the **American Association of Physics Teachers**, **Auburn University**, **College of Charleston**, **North Georgia College and State University**, and **Furman University**. He was an IAP faculty team member at **St. Joseph University**, PA, **Wofford College**, SC, **Clemson University**, SC and **Southern Catholic College**, GA. He also teaches laymen *Physics for Realists* principles in seminars and journal publications. Daw says, *Many of my freshman Physics for Realists Electricity & Magnetism students jumped into the junior-level E&M course (Griffiths) and they all did quite well. In fact, many of the more advanced physics majors (who had not had freshman E&M with IAP's Physics for Realists textbook) relied on them for help with their homework because the Physics for Realists students understood the subject so much better.*

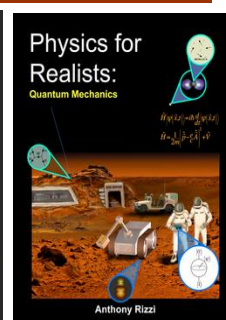
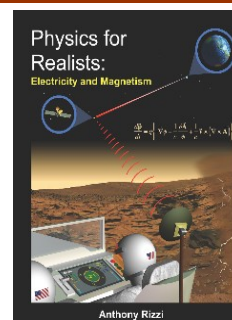
Clemson faculty and students continue to praise Daw and *Physics for Realists*:

What you are proposing is revolutionary. You should teach this to everyone. Statement made to Prof. Daw by physics colleague Prof. Jian He, Clemson University. Prof. He was flabbergasted at learning that he, himself, did not know what a basic concept like momentum was till Dr. Daw told him. This is how fundamental IAP's work is. None of us know the basics, including physicists (including Dr. Rizzi before starting his IAP research). Without IAP, basic concepts are not understood.

I want you [Dr. Daw] to know that I really appreciate all you have done for [my son (Daw's student)]! He speaks of you with such respect and admiration, and being a part of the Institute for Advanced Physics has meant a great deal to him. ... Thank you for being his mentor and friend.

...In talking with other people taking the general sections of both Phys 1220 and 2210, I quickly noticed an incredible distinction in the classes, not only in the material taught, but the method behind the teaching. To be honest, there was a part of me that wished I could simply be asked to manipulate equations, but I have come to better understand the importance of actually learning and knowing the fundamental principles. I appreciate how you emphasized how vital it is that physicists actually understand how something works – questions need to be presented and resolved....

The way in which ...the foundations of physics [were laid in PFR] was awesome. I have an intuitive understanding of things that I have never been able to comprehend before. I love [the PFR] teaching methods and am really glad I was in this class.



<http://www.iapweb.org/store/>

New Volunteer Members



Brian Lane

Brian Lane is a Quality Assurance and Safety Consultant working at the **Centers for Disease Control and Prevention** in Atlanta. He is a two-time recipient of the Battelle Memorial Institute *Outstanding Performance Award*. He



Noah Lett

earned a B.A., Philosophy, *magna cum laude* from Gonzaga University and a M.S., Medical Science from University of South Florida in Tampa. Prior to working as a consultant, he worked in management as well as a researcher on chemistry and biology projects.

Noah Lett is a former Lutheran minister (Queens, New York), who converted to the Catholic faith in 1989. Lett works as a theologian with the **Eternal Word Television Network** in Birmingham and is a frequent host and guest on the network.

Both Lane and Lett participated in the Institute for Advanced Physics *Science Before Science* conference at LSU in 2018.

College Student leads Science Before Science Study Group

Peter Maggio, a junior at Texas A&M majoring in Computer Engineering, is leading a group study of *The Science Before Science: a Guide to the Thinking in the 21st Century* (SBS) by Dr. Anthony Rizzi. The group meets weekly in College Station, Texas to view the SBS DVD series and discuss the reading and its application in their daily lives. The participants, primarily college students, are very excited to have the fundamental truths found in SBS explained to them for the first time. Dr. Daw (in March) and Dr. Rizzi (in April) each joined for one session to answer questions. **Giuseppe Rizzi**, an IAP Volunteer Member and junior at Texas A&M majoring in Electrical Engineering, is assisting Peter. Peter participated in the Institute for Advanced Physics' *Science Before Science* conference at LSU in July 2018.

SBS groups have been and are now occurring around the country. We encourage you to form your own group in your local area. Order your copy at smile.amazon.com/ and choose the Institute for Advanced Physics as your charity!

Photo: Peter Maggio (on far right) pictured with some of the study group members.



Kid's Book on Radio and at Convention Booth



On March 21-23, Associate Member **John Sudnick**, Volunteer Member **Krish Ramanathan**, and Associate Member **Anthony DiCarlo** (pictured left to right) manned a booth at the **South Carolina Homeschool Convention** in Greenville, SC. *A Kid's Introduction to Physics (and Beyond)*, Vol. 1 was the featured publication, but much of IAP's material was also explained and made available. Mr. DiCarlo also gave a talk at the convention

entitled *Why Physics is Essential to Your Homeschool Curriculum*.

In February, Mr. DiCarlo was on "Real Presence Live" broadcast by the **Real Presence Radio (RPR) Station**. RPR has signals in North Dakota, Minnesota, South Dakota, and Wisconsin. Mr. DiCarlo was also on **Catholic Radio** in South Carolina. This was a recorded talk airing April through October of this year in South Carolina. In both programs, he discussed *A Kid's Introduction to Physics (and Beyond)* and the *Physics for First Communion* DVD, as well as emphasized the fact that understanding generic physics is necessary for everything, including a proper understanding of the Catholic Faith.

Comments over heard among 14-year-old boys on the playground who did not have an Institute for Advanced Physics *Physics for Realists* education....

"Atoms are mostly empty space. I wonder why you cannot walk through walls."

"You can't play tag because you can not touch a person."

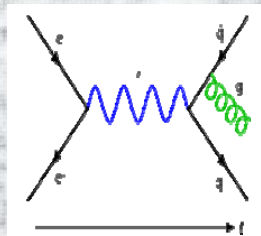
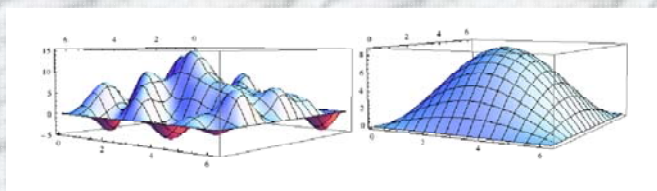
A Kid's Introduction to Physics (and Beyonds) teaches children (and adults) the generic physics needed to understand the world around them and their place in it.

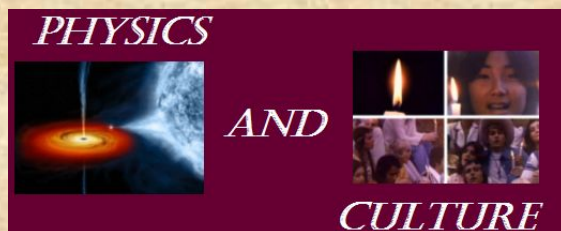
**The Institute for Advanced Physics presents
its 17th annual conference**

Quantum Field Theory

by invitation only

**July 24 – July 27, 2019
Louisiana State University**





Check out resources at IAP's online magazine

Historic Discovery: Gravity Waves!

View "gravity wave effect on man" animation

What is Science? **NEW**

The World Just Got More Empirical Today (Nov 2018)

Death of Justice?

What is the Difference Between a Lab and a Border Collie?

Physics and "Judge not that you might not be Judged"

Is there in Truth, Beauty?

Is Your Computer Real?

How to Learn in Four Steps

A Brief History of Nothing

How Do I Know My Hand Causes Movement?

The Problem of Our Failing Culture and its Solution

Answering Dawkins on Simplicity of God

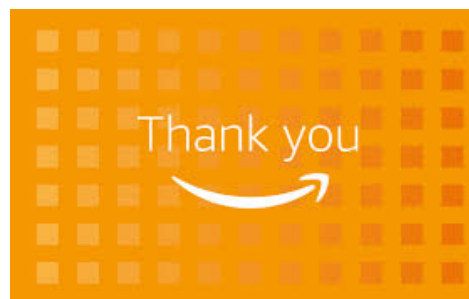
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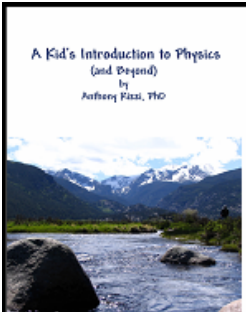
In order to continue our important research and education outreach, we need your help. **Please support our work with a \$2 donation for each article you read** in our online magazines *Physics and Culture* and *Journal of Physics and Math*. Here is the link to donate: [Donate](#)

Please consider a larger donation to facilitate our many activities. Thank you




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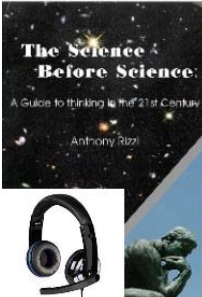


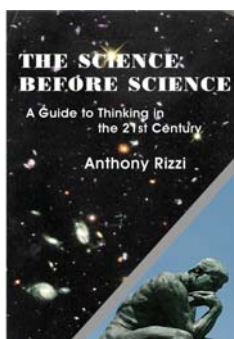
Audio Books



A Kid's Introduction to Physics (and Beyond) Vol. 1
Audio version \$16

The Science Before Science: A Guide to Thinking in the 21st Century
Audio Version \$30
www.iapweb.org/store/



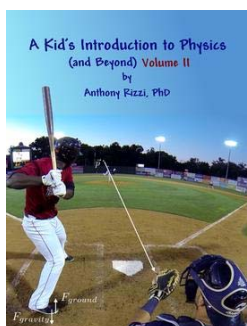


New on EWTN
Coming soon (date and time TBA)



Science Before Science Conference

In this two hour overview of the 15th Anniversary SBS conference, EWTN viewers will join the Institute for Advanced Physics' as three IAP members and three IAP mentors teach the truths that are fundamental to our lives. Dr. Rizzi was also present to answer questions. The conference was a once in a lifetime opportunity to learn the principles as well as practical applications for work and home and in so doing grow and enjoy rare fellowship in truth. Watch and be a part of it!



Coming January 29, 2020

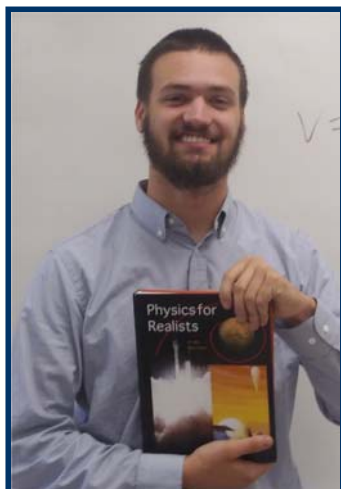


A Kid's Introduction to Physics (and Beyond) Volume II

EWTN Live host Fr. Mitch Pacwa discusses this new release with physicist Dr. Anthony Rizzi.

“Physics for Realists changed my thinking and understanding of everything!”

Michael Rutland, senior, Belton-Honea Path High School, SC



When I took math and science classes in the past, I always wanted to understand the 'why' behind the concepts I was taught. I wanted to see the proof. I hated the fact that it just 'worked', so I would ask the teachers why and they could never answer my questions until I started taking Physics at Belton-Honea Path High School which uses The Physics for Realists (PFR) textbook by Dr. Anthony Rizzi. At first, the only reason why I signed up for Physics is that my chemistry teacher told me that physics

is all math. I was really good at math, so I signed up for the class with no knowledge that Rizzi's works would completely change my life. It changed my thinking and understanding of EVERYTHING. Rizzi opened a new world to me because I got to understand what the equations mean. It made me realize how little I actually know and understand, and I wanted more, so I bought The Kids Introduction to Physics (Volume 1 & 2) and the Science Before Science. I am looking forward to studying these books this summer. Learning physics from PFR this year even made me change my mind about the major that I will pursue in college. I changed from Computer Science to Math to Physics at Clemson University (where I will continue to study physics using PFR) all in the same year. I had no idea that Physics is what I was looking for all along.

The World Just Got More Empiriological Today

Kilogram is Redefined

by Anthony Rizzi

As you know, IAP is tackling the core of our deep cultural problems, which is our science not being clearly grounded in the principles that every child knows. IAP is repairing the core of our culture by grounding its core thinking, modern science, in our knowledge of the physical things that we know directly through our senses. To give people insight into this deep need (which is currently only addressed by IAP), IAP magazine and now IAP Journal of Physics and Math have been initiated.

In Physics and Culture articles (complete articles located on the IAP web site at the below link), Dr. Rizzi shows us how the basic physics teaches us the meaning of something that we probably think we already know, but actually don't!

Today, the pound was redefined! It no longer simply refers to the mass of a piece of platinum in France.¹ You *now* need to know quantum mechanics to know what a pound is! In fact, this could be misleading for a pound is defined in terms of the kilogram and it is really the kilogram that was redefined.

Think about it. The simple thing that everyone experiences, mass (and weight) needs the Schrödinger equation to be understood! What's the Schrödinger equation? That's a good question. Few know it. I'll write it if you promise not to run away.

First, a story that will, hopefully, help calm your fears. I once was on a radio show in which I was speaking with a man and woman who together host the show. When I mentioned the Schrödinger equation on the air, the woman said that she had never heard of it. The next time that I was on the show, some days later, I mentioned that my wife, after hearing the last show, had said "I never heard of the Schwarzenegger [i.e., Arnold, the then

famous movie star] equation either." And, the woman, instead of laughing (the man did), said "oh that makes me feel better!" The Schrödinger equation just isn't something many even know about. Think about how far removed the kilogram just became!

As I promised, here it is, the Schrödinger equation:
$$\frac{\hbar^2}{2m} \nabla^2 \psi + V\psi = i\hbar \frac{\partial \psi}{\partial t}$$

The Kilogram

So, how exactly is the kilogram defined? You may add: "Is there a way to understand it that will not make *me* learn this equation." "Can someone that knows this equation, explain it in layman's terms?" Yes.

Well, you need to know other things first. You may have thought you knew how a meter was defined. You may think you know how a second is defined. A meter should be just the length of some stick. A second should be one tick of say a clock.....

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To support IAP's research that leads to the understanding and writing of these articles, ***we ask for a donation of \$2 per article that you read or download.*** There are more articles at <http://www.iapweb.org/iapmagazine.htm>

Anthony Rizzi, Ph.D., founder and Director of The Institute for Advanced Physics (a 16 year old non-profit organization with Vatican backing), gained worldwide recognition in theoretical physics by solving an 80-year old problem in Einstein's theory. He has physics degrees from MIT and Princeton University. Prior to IAP, he was senior scientist at Cal-Tech's Louisiana LIGO and taught at LSU. LIGO won the 2017 Nobel Prize in Physics.

¹ The definition was officially accepted today (Nov. 16) but its use will not be "enforced" till May 20, 2019. This definition was promulgated by The International Committee for Weights and Measures (CIPM).

The Glory of God is a Man Fully Alive

by Dr. Anthony Rizzi



The Society of Gilbert Keith Chesterton published this article in its Gilbert! magazine Volume 22, Number 2, November/December 2018 issue. The following is a portion of the article which can be read in its entirety in the magazine by going to this link

*<https://www.chesterton.org/shop/gilbert-vol-22-2/>
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Chesterton's book, *Manalive*, captures, in his joyful style, a deeply disturbing and deeply wrong element of our scientized world by exposing its pretensions and contrasting them with the truth.

Now, Chesterton did not know that the problem of our culture was its unexamined equational physics, but he did see the poisonous fruits of that incomplete physics, which acted, though less strongly, even in his age.² And, he fearlessly warned people of those poisons and attacked them with his considerable talent. If I were to summarize what he is saying in *Manalive* I would say: "Chesterton exposes the closed, small world of rule-following that is the center of

our modern way of thinking, acting, and being (all of us have it at some level). He shows that, as opposed to this dark, rule-centered world³ which we choose, there is the sunny world of reason in which truth reigns. A world in which we come to our senses! A world in which those things we know through our senses are reasoned from and acted on according to the reality they expose. It is a world that is lost on us but can be found if we but finally choose it."

I would then add that to truly do this we must choose to take the time to learn the fundamentals and bring them into our ordinary life.⁴

So, how does Chesterton bring us to the core insights above?

Innocent Smith is the central character. He is *the man who is alive* because he innocently follows the truth he knows and leads others to see its wonders. He is clever as a serpent but innocent as a dove! Such a character is barely seen in ancient, let alone modern, literature. And, Smith is successful in his endeavors! Adding this bit makes him nearly unique in literature.

Smith is on trial for multiple crimes that the rule-following (scientized) world *assigns* to him. His crime is not following the rules, even though everything he did was actually good! Smith wants to wake himself and others up to the depth and wonders of the world. Smith does this in multiple ways. For example, Smith is accused of burglary. Why? Well, he takes two churchmen.....

² After all, the scientism began at the birth of modern science in circa 1600. See A. Rizzi, *The Problem of Our Failing Culture*, Physics and Culture, 2011, <http://www.iapweb.org/iapmagazine.htm>, (this article also in G. Butera (editor), *Reading the Cosmos* (AMA, Washington, DC, 2011)), and see also A. Rizzi, *How a Neglect of Physics Has Turned Christianity into a Myth for Modern Man*, New Oxford Review, April/May 2013, pg 35/24.

³ We even, maybe especially, take this rule-centered path with the Ten Commandments. This is in the face of Jesus' explicit warning against it!

⁴ For the fundamentals that we are missing see, A. Rizzi, *A Kid's Introduction to Physics (and Beyond)*, Volume I and II (IAP Press, Baton Rouge, 2012, Vol. II: 2019). Also, see A. Rizzi, *The Science Before Science: A Guide to Thinking in the 21st Century* (IAP Press, Baton Rouge, 2004).