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Twenty-first Annual IAP Members Conference

by Ken Klenk, Ph.D., IAP Certified Member
 photos courtesy of Maikel Garcia, IAP Associate Member



(left to right)(standing) Fr. Neal Nichols, Benjamin Luna (holding laptop featuring remote participants (clockwise starting top left) John O'Connell, MD, Dr. Rama Podila, Nicolo Rizzi, and Dr. Ken Klenk), Kevin Blatchford, Randy Nichols, Fletcher Williams, Brendan D'Amato, Dr. Stephen Strickland, Dr. Anthony Rizzi, Giuseppe Rizzi, Ethan Robson, James Scheuer, Anthony Coniglio, Maikel Garcia, (front row, kneeling) Frank Camacho, Anthony DiCarlo, Dr. Murray Daw, David Giroir, James Louviere, not pictured Don Caffery and Kateri Rizzi

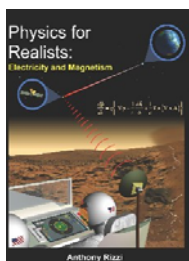
Annual conference story continued from page 1...

The Institute for Advanced Physics (IAP) 21st annual summer conference, *Physics for Realists XX: Quantum Field Theory (QFT) V*, was held on Wednesday, July 19, through Saturday, July 22, 2023 on the campus of Louisiana State University. To start things off



on Wednesday after check-in and lunch at a nearby Mexican grill, the participants gathered for a *Primer on Physics for Realists* led by **Dr. Murray Daw**, IAP Faculty and Certified Member. He reviewed important

fundamental physics principles found in the IAP textbooks – *Physics for Realists: Mechanics* (PFR-M) and *Physics for Realists:*



Electricity and Magnetism (PFR-EM). Later that evening, participants gathered to enjoy pizza and soda and lots of good conversation, as well as talks on the IAP Central Theorem



given by IAP Associate Member and Professor of Practice, **Fletcher Williams**. His talks included examples that helped illuminate the pervasiveness and severity of the cultural problems that IAP alone is working to address.

Thursday morning, **Dr. Anthony Rizzi**, IAP founder and Director, began the conference with a welcome and introduction. In his remarks he reminded the participants of the harmful results of the growing scientism in our world that comes from equation-alone

thinking. The conference then turned to the topic of quantum field theory and the QFT text book. Dr. Rizzi gave talks on the *Full Lagrangian Dynamics Ontologically* and *Full Action and Hamilton's Principle of Least Action*, in which he explained what these deep formalisms really mean.

The Thursday morning sessions concluded with some awards. **Dr. Rizzi** recognized several participants for having achieved IAP Associate Member status: **James Scheuer** (*top photo*), **Kevin Blatchford** (*middle photo*), and **Ethan Robson** (*bottom photo*) were all recognized for successfully completing the rigorous requirements to become IAP members; each received his membership certificate.



The Thursday afternoon sessions included talks on several major concepts of the QFT textbook as well as several breakout sessions. To start the afternoon, Dr. Rizzi gave a talk on Path Integrals, Brownian Motion and their relation to QM while IAP Associate Member



and Membership Director, **Anthony DiCarlo**, led a breakout workshop for members who were not directly involved in the production of the QFT textbook (called the Building Principles group). The workshop gave

participants an opportunity to see examples of common problems in modern thinking that result from the ungrounded physics of our culture and to begin trying to address those bad habits in themselves.

Back in the main track, Dr. Rizzi explained the connection of Path Integrals to the Schrödinger presentation of QM and Fletcher Williams discussed how physics is centered on relations alone using special relativity as an example. In his talk, Mr. Williams discussed the approach of J.D. Jackson's empiriometrically excellent and well respected textbook to relativity and contrasted it to the principled way that special relativity is presented in *PFR-M*. Dr. Rizzi continued the afternoon with talks explaining what the Klein-Gordon and Dirac equations look like in the $v \ll c$ limit. He also explained how Dirac went from QM to E&M. Next, Dr. Rizzi presented his groundbreaking talk *Finally, What is a Photon?*, (see Spring 2023 Newsletter).

After these talks, the main group broke up, as is tradition, into two breakout sessions— one session to write QFT problems for the textbook and another session focused on problems in the popular understanding of quantum mechanics (QM). To close out the afternoon session, the Building Principles group rejoined the main group for two talks by IAP associate members: **Giuseppe Rizzi's** (photo top right) talk



on *ChatGPT and AI* and **Frank Camacho's** (middle photo) talk *IAP Virtues II and App*. The afternoon session ended with IAP Associate Member and **Chaplain Father Neal Nichols**, FSSP, (bottom photo) leading the group in the IAP prayer and the singing of the *Salve Regina*.



Thursday evening the conference continued in the activity center where IAP Certified Member Dr. Stephen Strickland conducted several experiments to demonstrate various aspects of work that IAP is studying (see the following article). This was followed by discussions led by Fletcher Williams and Dr. Rizzi on the work of the Wright Brothers, drawing inspiration and

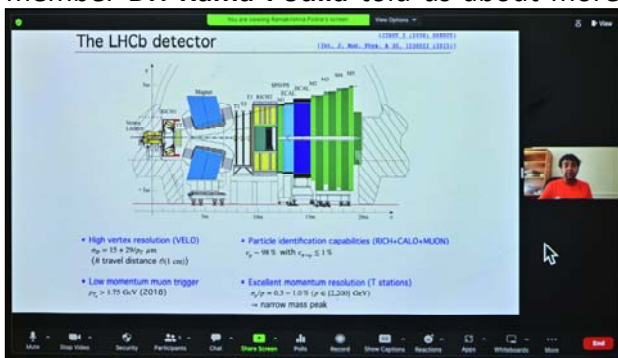
encouragement from their tenacity and perseverance in seeking true knowledge, following through on all four steps, to solve the problem of flight; IAP members need to strive for the same strength of character that the Wright Brothers exhibited in learning how to fly.

On Friday morning, sessions began with Dr. Rizzi giving the latest revision of the *Table of Contents* for the *Physics for Realists: QFT* textbook. This was followed by Anthony DiCarlo's talk *Living What You've Learned, Step 3ing IAP IV*, which was a continuation of his reflections on the Four Steps of Learning and the importance of integrating the truths that IAP has made available into our lives. Dr. Rizzi then explained the historical cause and development of the growing empiriometric-alone thinking, which plagues our culture more than ever today, in his talk *The Scientism after Science*.

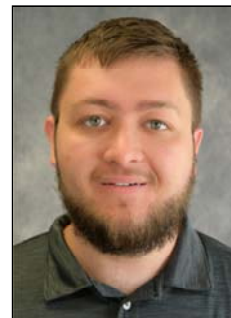
Friday afternoon sessions began with an audio presentation of the core of Kurt Vonnegut's *Harrison Bergeron*, followed by analysis and discussion learning what the story teaches us about the modern world. After this, Dr. Rizzi gave a talk entitled *From Dirac Phase and Potential Momentum to the Strong Force* for the main (QFT) track while the Biology group broke off to continue its work of developing a companion for the textbook *Biology* by Campbell, and the Building Principles group broke off to discuss examples of the IAP Virtues and their opposing vices. Back in the main session, Dr. Rizzi's talk was followed by Dr. Daw's talk *Deeper into Standard Model*, and then Dr. Daw handed the torch back to Dr. Rizzi for his presentation of de Broglie-Bohm for Field theory. Next, the Biology group and the Building Principles group rejoined the main track, and **Dr. Stephen Strickland** gave an update on the status of the design of the cover for the QFT textbook which sparked lots of good conversation. Then IAP certified member **Dr. Rama Podila** told us about more



Experiment Challenges the Standard Model, Maybe, and Frank Camacho gave an update on the Status of the Manned Space Missions. Fr. Nichols closed the Friday afternoon session with a prayer. Friday evening the group enjoyed a wonderful dinner and lots of good fellowship, including a variety of talks: Dr. Daw presented *Collapse of the Collapse*, a talk based on the



groundbreaking understanding of quantum mechanics given in PFR-QM which corrects the popular but false understanding of “collapse”; IAP Associate Member **Benjamin Luna** gave a talk about how *All Uniform B Fields are not the Same*; Fletcher Williams also led a discussion on the topic of Faith, Science, and Reason. The group watched a recording of a debate between a renowned atheist scientist and a renowned religious scientist and analyzed how the equation-alone thinking at the base of our culture fundamentally confuses both camps (the anti-religious and the religious). The conversation and fellowship continued late into the night during each night of the conference.



The conference ended on Saturday morning with breakfast and closing discussions. As in previous years, many profound insights were gained throughout the conference by all the participants and friendships were built and strengthened. Another successful conference in the books!

Article contributor **Dr. Ken Klenk** has been an IAP Certified Member since 2006. He works as an independent consultant. He has managed space and earth science projects in support of NASA Goddard Space Flight Center, Jet Propulsion Laboratory and the U.S. Geological Survey.



Photos courtesy of **Maikel Garcia**. Maikel has been an IAP Associate Member, Level II, since 2013. He is currently teaching: Adjunct Professor, Physics and Astronomy at Odessa College; Adjunct Professor, Mathematics at Austin Community College; Instructor at Leander High School, Leander, TX.

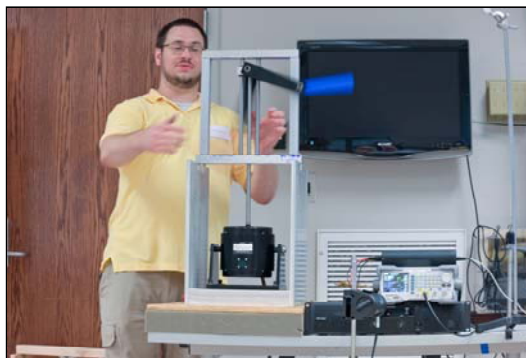
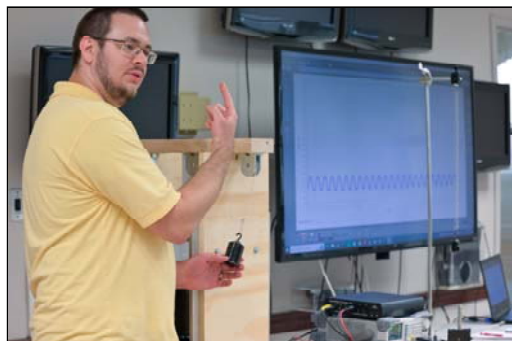


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Conference Experiments

by Stephen Strickland, Ph.D., IAP Certified Member
photos courtesy of Maikel Garcia



Simple harmonic motion & the Plane pendulum

We opened the session by discussing the simple harmonic motion of a plane pendulum. When a bob is suspended vertically by a rope, the gravitational and the tension forces cancel, and as such, the bob does not gain any impetus, remaining at rest. When displaced a small distance horizontally and released from rest, the tension force is redirected slightly inwards and activates impetus in the bob which then moves the bob back towards the equilibrium point. However, upon reaching the equilibrium point where the gravitational and tension forces cancel, the bob continues to move! Its impetus continues to move it. On passing equilibrium, the tension force is directed back the other way and begins to deactivate the impetus until the bob comes to rest whereupon the tension force activates impetus back to the equilibrium point. This process continues over and over again.

We noted that for a linear oscillator, like a mass-spring oscillator, the period of the oscillation is independent of the amplitude; however, for the plane pendulum, when the amplitude of the oscillation becomes significant (e.g. 90 degrees), the period of the

pendulum becomes longer as the bob is not subject to as much force at the extreme limits of its motion.

Parametrically driven pendulum

We then looked at a type of resonance with the plane pendulum. Ordinary resonance would occur if we apply a horizontal driving force which is in sync with the bob's impetus, so that the force only acts when it is in the same direction as the impetus. Being in sync, the force always increases the intensity of the impetus, enabling the bob to move further faster, and thereby increasing the amplitude of the oscillation. This requirement of synchronization leads to the rule-of-thumb that the driving frequency must be equal to the natural frequency in order to achieve resonance.

Instead of ordinary resonance, we examined a more subtle type of resonance called parametric resonance wherein we vary one of the parameters of the oscillator. In particular, we used a mechanical shaker to change the length of the pendulum tether. Further, in order to achieve parametric resonance, we have to run the shaker at twice the natural frequency,

not at the natural frequency as with ordinary resonance.

At first, this process seems paradoxical: How does the additional vertical forcing lead to increased horizontal motion? Why must the driving frequency be double? Consider a period of the oscillator and of the driving force beginning with the tether being shortened at the same time that the pendulum starts displaced to the right of equilibrium. The shortening of the tether increases the tension force (which is slightly angled inwards). Then, a half oscillation later for the pendulum, the bob is now to the left of equilibrium and will begin gaining impetus to the right. In order for the driving force to be in sync with the impetus, the tether must be shortened again. That means that when the pendulum has only completed half a cycle, the driving force must be starting a new cycle. Therefore the driving frequency must be double that of natural frequency of the pendulum.

But there is a final subtlety about parametric resonance. The amplitude of the driving must exceed a certain intensity (a critical threshold) before the amplitude will grow. This amplitude corresponds to that which balances the driving and drag forces. If the driving force is stronger than the drag force, then there will be more force than is necessary to maintain simple harmonic motion, and thus the amplitude will grow. Otherwise, it will decay until the bob is at rest at the equilibrium point. By contrast, in ordinary resonance any driving amplitude can sustain an oscillation; there is no threshold for ordinary resonance.

Systems of harmonic oscillators & the Double pendulum

After understanding the motions of a single pendulum, we setup a double pendulum. Unlike the previous simple pendulum comprised of a bob on a tether, these pendulums were long rectangular steel plates mounted on one end to a smooth bearing. In

the double pendulum, the top of the upper plate was mounted via a bearing to a rigid fixture while the bottom was attached to a second smooth bearing that supported the top of the lower plate. As such, the upper plate and the lower plate could turn freely about these bearings.

Upon small displacements, the double pendulum would exhibit two modes of oscillation, a symmetric and an anti-symmetric mode just like a pair of coupled mass-spring oscillators. In the symmetric mode, the two plates would swing almost like they were one very long pendulum. In the anti-symmetric mode, as the top plate swung one direction, the bottom would swing the other. On large displacements, where the forces on the plates become non-linear, the two modes were no longer distinctly identifiable. We could even start a large amplitude symmetric-like initial condition only to find later that the lower pendulum was spinning vigorously while the upper stood nearly stationary straight up-and-down.

To highlight the progression into chaotic motion, we had a second double pendulum, and we arranged the two sets of double pendulum so that one was in front of the other. To demonstrate the consistency of the two at smaller oscillations, we drew both back the same distance and released them from rest at the same time. On seeing the excellent consistency of the two sets in this small and medium displacement cases, I drew them back to a larger displacement wherein the non-linearities would be significant and released them with one raised slightly more than the other. Although both began by falling back to equilibrium, the one initially raised further would later begin to spin the lower steel plate while the other would not. Many such runs showed that similar small changes to the initial conditions would produce significantly different behaviors in the pendulum's motions, an essential feature of a chaotic system.

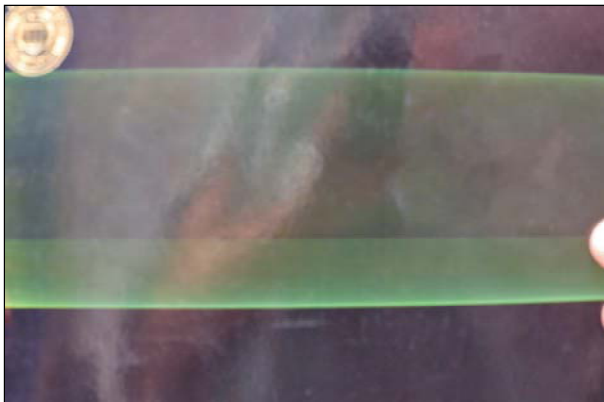
Waves on a string



The shaker was reconfigured to drive a 20 m length of fishing line. The fishing line was tied to the shaker on one end and supported by a pulley on the other where a weight of nearly 1 kg tensioned the line. With this arrangement, if one plucks

the end of the string, the parts of the string that are lifted in turn lift the neighboring parts (plucking force acts against the tension force of the line), activating an upwards impetus. These neighboring parts move upwards and in turn lift their neighbors. This process repeats, thereby propagating the pluck along the length of the string. By having the shaker “pluck” the string repeatedly (shake the string) at different frequencies, we could excite waves of different wave lengths. Some waves whose wavelengths are commensurate with the length of the fishing line will resonate, growing to a large amplitude that is easy to see. These waves yield standing waves with big anti-nodes that vibrate at the driving frequency and tiny nodes where the string hardly moves at all.

On establishing a resonant standing wave on the fishing line, we setup a stroboscopic light. On synchronizing the light to the driving



frequency, the wave would appear frozen with its wiggles easy to see. On slightly detuning the light's frequency, we could progress through the wave's oscillation, seemingly allowing the wave to progress in slow motion. We could see clearly that although some standing waves would oscillate up-and-down in nearly a plane, in other waves the plane of oscillation rotated as the wave moved down the length of the string.

Thermal expansion

Looking to thermal physics, we examined the thermal expansion of metals. Starting with a brass sphere and a brass ring both at room temperature, we saw that the sphere was slightly too large to easily fit through the ring. The sphere could even be placed upon the ring without falling through (an interference of a couple thousandths of an inch). After heating the ring with a MAPP gas torch, raising its temperature by a few hundred degrees centigrade, the brass sphere could easily pass through the ring. In heating the ring, every dimension of the ring expands. The out diameter increases AND the inner diameter too. The increase of the hole's diameter comes from the expansion of the sides and the top and bottom. As the sides expand in height, they increase the height of the hole, and that the top and bottom of the ring also expand in their width, they increasing the width of the hole.

We performed a similar experiment with a bi-metallic strip. This strip is shaped as a long rectangle of small width but with a very small thickness. This shape allows the strip it to be flexible in the direction of the thickness. The strip is made by taking a rectangular steel alloy of the same length and width but only half the thickness, and fusing it to a brass alloy of the same dimensions. At room temperature, this bi-metallic strip stands straight up, but upon heating with the MAPP gas torch, the strip bends over, nearly doubling over in the direction of the steel side of the strip. As the temperature rises in both materials, both

expand; however, the brass expands more than the steel. Since the two are fused together, the strip must arch in order to allow the brass to be longer than the steel.

These experiments show very clearly an example of a quality (i.e. temperature) conditioning quantity (i.e. length).

Heat engines

We concluded the experiment session by examining three heat engines: a Stirling engine, a steam engine, and a magnetic hysteresis engine.

The steam engine comprised a boiler tank which was connected by a small pipe to a drive piston. The piston head was in turn attached to a fly wheel which assisted in the smooth operation of the piston. As the water in the tank was heated and boiled, the various molecular parts within the water and steam gained impetus, each part getting impetus in a different direction. Since there is no preferred direction in which impetus is given or taken away, as the parts collide with the walls of the container, whatever impetus is given to the container in one direction is cancelled by another collision giving impetus in the opposite direction. Thus the whole tank remains stationary even as the average intensity of impetus increases. The pipe allows the highly active steam to move to the piston where these molecules strike against the piston head. As the heating continues to increase the intensity of impetus of the molecules, they push harder and harder against the piston head until their combined force overcomes the force holding the piston in place. Then they impart impetus to the piston head, thereby moving the piston head downwards. On reaching the bottom of the piston chamber, a valve at the top of the chamber momentarily closes the access to the pipe while a valve at the bottom allows the highly energetic steam in the piston to escape, releasing the pressure in the piston. The flywheel then easily carries the piston back to

its top position and toggles the two valves back to their original state. The hot steam provides enough force that the simple engine can easily operate hundreds of times per second.

The Stirling engine begins similarly where a gas is heated in one chamber and directed by a pipe to a piston wherein the molecules of the gas strike against the piston head, pushing it back; however, the Stirling engine does not bleed off the pressure as the steam engine does. Instead, a displacer (a large Styrofoam cylinder) moves into the heating chamber forcing the air away. The air then cools, losing its impetus and energy, thereby reducing the pressure on the piston head and allowing the piston head to easily cycle back. As the piston head returns to its original compressed state, the displacer is removed from the heating chamber and the cycle begins again. This engine also operates very quickly and can be used to illuminate a series of LED lights.

The last heat engine shows that we do not always need a gas as the working medium. In the magnetic hysteresis engine, a steel washer is hung as a pendulum. A powerful magnet is placed to one side, and the steel washer is drawn to it. If left at room temperature, the horizontal magnetic force, the downwards gravitational force, and the tension for of the tether would all cancel, and the washer would remain stationary, never gaining any impetus. By placing a flame at this equilibrium point, we heat the washer until it grows red hot, eventually reaching the Curie temperature, where the atoms and electrons are no longer able to stay organized to maintain a magnetization. Losing the magnetic force, the gravitational and tension forces impart impetus away from the magnet, and the washer moves out of the flame. On cooling, the washer regains its organization, magnetizes again, and is pulled by the magnet back to the equilibrium point, back into the flame to repeat the cycle as long as the flame burns.

Dr. Rizzi invited to give talk at UT Dallas

by Giuseppe Rizzi and Maikel Garcia, IAP Associate Members



Dr. Anthony Rizzi gave a talk at the University of Texas in Dallas (UTD) on Tuesday, September 26 titled “What’s Wrong with the World? I Mean Really? A Physicist Answers.” Students from UTD, Southern Methodist University (SMU), and the



University of Dallas were invited. Attendance

included four priests including the pastors of both the UTD and SMU Catholic Centers, and

many young people interested in the Institute for Advanced Physics (IAP) from the surrounding Dallas area. Dr. Rizzi opened the event by addressing the growing list of symptoms emerging from our increasingly dystopian culture, such as the growing isolation and uncivil behavior, the lack of meaning and purpose in our lives, the rapid decline of Christianity, and morals generally. At the root of these evils, Dr. Rizzi explained, is the fundamentally anti-physical formation given to all of us implicitly through our culture because of the problem of scientism, our misdigestion and misunderstanding of modern science, which leads to a view of the world deprived of real understanding and fosters a general anti-intellectual attitude in our ordinary lives.

During the talk, Dr. Rizzi strongly challenged students with the fact that we don’t really understand the world or the problems with it in any clear way and that we need to stop thinking that our lives are fine when the world is clearly not fine. He showed the gradual progression by which the scientism (through its equation-alone approach) shifts our thinking from recognizing, or even looking for, the essence in things, to, instead, replacing

meaning with rules. We fill our daily lives with unexamined activities that come from not having been given any habitual attitude towards truth that matters in our ordinary lives. Essence is ultimately reduced to equations, to formula. Thus, reality becomes non-existent since equations only exist in the mind. In this view man is reduced to a systems-centered, machine-like entity, unable to think in a truly human way (which starts with the things we see through our senses). This leaves him incapable of recognizing what he is, what he is made for, or where his true dignity and uniqueness among physical creatures comes from, namely his ability to seek, know and live the truth.



Photo courtesy of Maikel Garcia

Physics, Dr. Rizzi stressed repeatedly, is both the problem and the solution because everything we know comes first from what we know through our senses, which is what physics studies. Our lack of meaning is born out of the undigested (but profoundly advanced) physics of our culture which can only be addressed with a healthy fully physical understanding (the IAP approach to physics). To illustrate this, Dr. Rizzi cited contemporary examples of absurd conclusions (e.g., that motion doesn’t need a cause, that time does not exist, that the colors we see are purely mental, that things don’t exist until we look at them) to show what we think we know clearly contradicts reality. This, he explained, is the profound effect that the bad physics of our culture has on all of us at the core

of our thinking. He explained the urgency for each of us to put in the time and intellectual effort to understand and fix this problem first in ourselves and then help others. He summarized the talk by clearly illustrating the stark contrast between a healthy fully physical understanding (the IAP way) and the equations-alone disintegrated understanding that follows from that physics, and which ultimately leads to the current irrationality and lack of meaning in our lives. And he concluded by asking the students “in which of these two worlds do *you* want to live?”

The talk was received with great enthusiasm and was immediately followed by a lively Q&A session between the students and Dr. Rizzi. After the talk, Dr. Rizzi and local IAP Associate Members **Maikel Garcia** and **Giuseppe Rizzi**, who also attended, engaged in further conversation with the attendees, addressing more questions about IAP’s work and the severe fundamental nature of the cultural problem of scientism and its solution, as well as inviting students to the *Science Before Science* college study group to take the next steps towards integrating a proper intellectual foundation into their own lives.

Physics for Realists: Electricity and Magnetism remote course

by Anthony Coniglio, IAP Associate Member



During the Fall 2023 semester, IAP Certified Member and Samford University physics professor, **Dr. Stephen Strickland**, taught a special course via Zoom on *Physics for Realists: Electricity and Magnetism* (PFR:EM) by **Dr. Anthony Rizzi**. The course lasted for 4 months and met once per week. It was attended by IAP Associate Members **Anthony DiCarlo**, **James Scheuer**, **Anthony Coniglio**, and IAP Associate Member candidate **Christian Captain**. In addition to the lectures given by Dr. Strickland, the course also centered around IAP Certified Member **Dr. Murray Daw’s** recorded lectures on PFR:EM - available on the IAP YouTube channel:

<https://youtube.com/playlist?list=PLZMfBHXXZsLD7VuIHziBY7pg7SXIGZtA&si=S27nDAvbShjcQHE5>

The course covered topics such as electrostatics, magnetostatics, magnetic induction, and the last quasi-static effect. Dr. Strickland did various demonstrations for the students throughout the course to provide a virtual “lab” experience that helped them grasp the course content. For example, one of these experiments demonstrated Ampere’s force law by flowing current through wires and showing that like impeti attract and unlike impeti repel. Another experiment demonstrated the aligning of compasses when a magnetic field is produced by current in a wire. Yet another experiment demonstrated the formation of an electron beam when a tungsten filament is heated, as well as demonstrated the bending of that beam when current flowed through coils surrounding it and the dependence on the strength of the magnetic field and accelerating voltage.

The deep content and explanations presented in this course grounded in common sense gave the students a rich understanding of electricity and magnetism, and they expressed much gratitude to Dr. Strickland for the time and energy he put into teaching them. The students and Dr. Strickland all look forward to growing in these truths as they continue their involvement in the Institute for Advanced Physics.

SBS College Study Group Begins its 4th Year!

by Christian Captain, SBS study group participant



The college study group based on *The Science Before Science* by IAP Director **Dr. Anthony Rizzi** began again this fall semester after ending last school year before summer break. Many previous members returned for another year of learning and studying together and many new members joined for the first time. It has been great to deepen so many friendships and form new ones! Over the summer, IAP Associate Member **Giuseppe Rizzi** interviewed senior group members for a special video he put together highlighting the importance of the group (IAPweb.org/why-do-sbsII). The online sign-up form for the group was also re-designed by Giuseppe and a brand-new flyer was made by **Christian Captain** with guidance and help from Giuseppe, Associate Member **Ethan Robson**, and Volunteer Member **Michael Rutland**. These new materials helped get the word out about the group by highlighting its guiding mission and essence: to reconnect us with the world and ourselves and begin to restore the intellectual foundations that we have been missing for our

entire lives. The meetings continued each time long after the “official” end time with lots of great questions. One group participant, a physics major at Clemson University, **Garrett Dean**, said about the group, “Studying with the group has provided me with a new lens with which to view the world around me. I cannot overstate the impact that the content of the study group has had on my depth of thought and comprehension of the world around me.” Another group participant, a chemical engineering major from the University of South Carolina, **Harrison Price**, said, “The study group has helped lay the foundations of my knowledge pertaining to all areas of my life. It is hard to overstate the joy that has come from learning the first physics, I recommend it to all!” The group finished the first half of the book before Thanksgiving and met before Christmas break for a social. It will resume on January 25th after the start of the spring 2024 semester for the second half of the book. Stay tuned!

IAP Community News

Special Mass for IAP offered at SMU



Fr. Wade Bass, pastor at Southern Methodist University (SMU) in Dallas, offered a special Mass on Saturday, September 16, 2023 for the intentions of the Institute for Advanced Physics (IAP). In particular, prayers were offered for the college *Science Before Science* study group which had just started in the new academic year. Students from many universities across the U.S. participate, including students from there at SMU, who meet in-person and join the other groups via Zoom. The Mass was attended by IAP Associate Member **Giuseppe Rizzi** and others in the area interested in IAP's work. Although unplanned when the Mass was scheduled, the Scripture reading for that day ended up being especially appropriate: the Gospel was on a man building his house with a rock solid foundation so that, when the flood waters come, the home will not be washed away. In his sermon, Fr. Bass discussed the relevancy of this parable to IAP's mission of grounding all of our thinking in a solid foundation that starts with what we know through the senses. The IAP is grateful to Fr. Bass for this special Mass and his prayers and support.

It was Love at First Physics

Ethan Robson and his wife **Kateri** (formerly Rizzi) first met in a *Science Before Science* college study group run by IAP Associate Member **Anthony DiCarlo**. Although separated by over 500 miles, they initially bonded over a shared interest in a first-principled understanding of the world, especially as it related to their lives in college. They grew their relationship through their ever deepening intentional decision to grow in the truth in and of and for each other (see *Love and Friendship*). They made use of a variety of

events, informal and formal, with the IAP community, including many years of the college study group of *The Science Before Science*. Ethan also led a series of IAP article discussion groups in which Kateri participated.

The truths that they learned through IAP were pivotal for both of them. Ethan, formerly an atheist after having lost the Faith in high school, came to know God through reading *The Science Before Science* by Dr. Anthony Rizzi. Kateri says that the principles IAP provided made it possible for them to have a fruitful and developing long-distance relationship, despite the limited in-person contact which they made every effort to expand by travel.

Ethan and Kateri were married in October 2023. They integrated into their wedding celebration many of the principles they learned through IAP. The wedding and nuptial Mass were beautiful, and the reception was outstanding. Everything from the food, music, speeches given, and good conversation made for a truly wonderful time. Fr. Nichols expressed a sentiment everyone felt; "it was story book"!



Mr. & Mrs. Robson with (left to right) subdeacon FSSP seminarian Brendan D'Amato (IAP member), priest Fr. Neal Nichols, FSSP (IAP member), and priest Fr. Brent Maher, St. Agnes Parish Pastor

Ethan and Kateri plan to continue growing in truth with each other and with the rest of the IAP community throughout their marriage, understanding that, through this growth, they will be able to become more and more the man, woman, and family who God made them to be. IAP wishes them a truly happy ever after!

New Session! DiCarlo SBS study group



Another study group based on *The Science Before Science* (SBS) led by IAP Associate Member and Membership Director, **Anthony DiCarlo**, (*top photo*) is underway! The group started meeting in October and will continue meeting into 2024. Mr. DiCarlo is being assisted by IAP Associate Members **James Scheuer** (*middle photo*) and **Maikel Garcia**, (*bottom photo*) and the group has been enjoying lots of lively discussion about foundational principles! If you are interested in joining an SBS study group like this one, email us at info@iapweb.org.



Institute for Advanced Physics

High school student grateful for *Physics for Realists* textbook

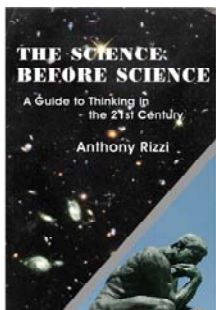
IAP regularly gets letters showing the life-changing impact IAP's material has on students. Below is an excerpt from one such student.

"Thank you so much for teaching this amazing class and for showing us Dr. Rizzi's holistic approach to physics. I've never had a stronger grasp on these situations and I'll undoubtedly be applying these lessons throughout the rest of my life."

Ian Janes, physics student in Leander, TX

Ian is a student of IAP Associate Member **Maikel Garcia** (*photo left*)

*Science Before Science:
A Guide to Thinking in the 21st Century*
by Anthony Rizzi



Available on Amazon
<https://a.co/d/7AWKj4j>

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Parable of Two Women

by Anthony Rizzi, Ph.D., Director of the Institute for Advanced Physics

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), Dr. Rizzi here introduces a “Parable of Two Women”.

This is a true story, but it is also a parable of our times. It is a story about a young woman and an older woman. Let’s call them Jane and Molly. These are not their real names which will help us to think of them as representing the thinking of each one of us. Every parable is, in the end, about a universal truth, not a particular man’s thinking. It is a story about each of us.

Jane’s Question

In a group discussion, Jane was upset about a recent decision of the Pope and was asking how we can maintain proper respect for the Pope when he says something that we think is wrong. I answered by explaining that we must start with the generic nature of authority that we can understand by reason alone.¹ That is, we must understand authority among men, and then and only then, can we understand any other kind of authority, including the Pope’s, which is said by analogy to it.²

A father, and by analogy even the Pope, only has authority insofar as it is true. In exactly the same way that the proofs of the

existence of God find that change can only be explained by the Unchangeable Changer (see KIP),² one can show that all authority must trace back to Him as well. Just as, ultimately, every new form that arises in any change has its new existence, as well as its continued existence, from Him, all authority does. We can say it this way: authority is only such insofar as it arises from the Author. Now, obviously, something arises from the source of reality only insofar as it is real! Authority exists to promote truth in understanding and in action. A father and mother give birth to children and by nature have the responsibility and the authority to raise them. That is the reality of the situation. Raising them cannot include things that, for example, harm their human nature or that of another. This would not be raising them, but damaging them. This would not be true use of authority.

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Anthony Rizzi, Ph.D., founder and Director of The Institute for Advanced Physics (a 20-year-old non-profit organization), 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 Nobel Prize in physics 2017. In addition to professional publications, he is author of the Physics for Realists textbook series, The Science Before Science, and A Kid’s Introduction to Physics (and Beyond) Vols. I & II.

¹ In using the phrase “reason alone,” I mean reasoning starting with what we know through the senses.

² What we don’t see can only be understood by analogy to what we do see, for everything we know comes through what we know through the senses (See (KIP) *A Kid’s Introduction to Physics (and Beyond) Vol. I*, A. Rizzi (IAP Press, 2012) and (SBS) *The Science Before Science: A Guide to Thinking in the 21st Century*, A. Rizzi (IAP Press, 2004)).