



## THE INSTITUTE FOR ADVANCED PHYSICS

# The Institute News

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## Eighth Annual Conference at Notre Dame

by J. Clifton Hill, PhD, C.S.Sp.

Certified members of the IAP met once again on the campus of Notre Dame University for the Eighth Annual Conference of the Institute for Advanced Physics, July 21-24. Presentations and discussions focused on the first six chapters of the upcoming text, *Physics for Realists: Electricity and Magnetism*. This follows the first volume in the series, *Physics for Realists: Mechanics*, and, building on concepts developed in the first volume, does ground-breaking work in presenting the full physical meaning of electrical and magnetic phenomena. IAP members continue to push forward in uncovering and manifesting the full meaning, context and foundational grounding of modern physics. Only with such grounding in the base science can we reverse our culture's free-fall. *Story continues on page 2...*



*IAP members and faculty, from left to right: Dr. Ken Klenk, Dr. Joe Haller, Dr. Dan Welch, Fr. Neal Nichols, Dr. Anthony Rizzi, Fr. Benedict Ashley, Fr. Clifton Hill, Dr. Joe Martin, and Dr. Murray Daw*

*Annual Conference story continued from page 1...*

**Photo right: Dr. Anthony Rizzi**, MIT and Princeton physics graduate and Director of IAP, introduced the textbook and, over the course of two days and six presentations, explained six of the seven chapters he has written. A salient feature of his research involved in the writing of the text is the paramount importance of the electric potential and the magnetic vector potential in any realistic explanation of electricity and magnetism. The participants were treated to some “flip movies” developed by Dr. Rizzi which illustrate aspects of these potentials as they propagate and which will be incorporated into the text. The members vetted the material and sparked discussion, furthering both the research and writing.



**Photo left: Dr. Murray Daw**, IAP Adjunct Professor and Bowen Professor of Physics at Clemson University, gave a presentation on fields, a topic of cardinal importance in the study of electricity and magnetism.

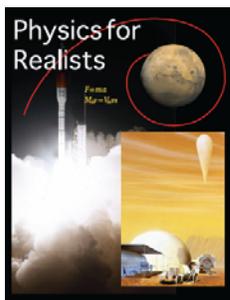
In an afternoon session Dr. Daw related the importance of the steps enunciated by Dr. Rizzi in his paper *How to Learn in Four Steps* in teaching courses using PFR Mechanics on three separate occasions at Clemson University.

**Photo right: Dr. Joe Haller**, IAP faculty member, gave a brief explanation of how *Physics for Realists: Mechanics* will be presented on the internet via a six-hour course with the instructor presenting graphical and textual material, accompanying these with verbal explanations. The participants can interact with the instructor via questions and observations. It is essential for those who will teach from *Physics for Realists* for the first time to be introduced to its deep concepts by one who has truly digested them.

In a separate session Dr. Haller explained how he is developing original software which demonstrates the “flip movie” propagation developed by Dr. Rizzi.



*Annual Conference story continues on page 3...*



### Dominicans Study *Physics for Realists*

In spring 2010, at the Dominican House of Studies in Washington, DC, a group of 12 men studying for the priesthood in the Dominican order completed a study in which they read and discussed and worked through *The Science Before Science: A Guide To Thinking in the 21st Century*, under the leadership of Br. Justin Brophy. This fall, they began studying *Physics for Realists: Mechanics*. The students of varying backgrounds from law to physics are enthusiastic about the approach that PFR takes in understanding our world starting with those simple things given to us through the senses and in understanding the proper place of modern science in our thinking and doing.



*Annual Conference story continued from page 2...*

On Thursday evening after dinner the participants conducted some fascinating simple experiments involving electricity and magnetism. *Photo above, left:* A magnetized ball dropped through a copper tube slowed noticeably as it fell due to the interaction of the ball with the A-field it induced in the conducting tube. *Photo above, center:* In another experiment a “wand” with a strong electrostatic charge [it contained a small Van de Graaff generator] could control the ‘flight’ of a charged tinsel-like ‘butterfly’.

On three separate occasions during the conference, members split into breakout groups to devise homework problems for the new text, suggest possible designs for the new text’s cover and decide on the reference material that will appear inside the book’s covers. Among many other things, a cover design was chosen.

*Photo above, right:* On Friday evening, **Fr. Benedict Ashley, OP**, Professor of Philosophy at IAP and emeritus Professor at the Aquinas Institute, St. Louis University, gave a short talk. He has been working with IAP members on philosophical and other issues, including helping with the translation of Latin texts, since the incorporation of the Institute for Advanced Physics in 2003. In his talk, Fr. Ashley discussed the history of efforts in the 1940’s and 1950’s to recover the true understanding of St. Thomas’s philosophy and stressed the essential importance of IAP’s work in solving the 400 year old problem that confronts our culture.



*The next issue of Journal of Integral Physica (Vol. 2, No. 1,) was published by IAP Press in October 2009. This issue contains, among other things, papers that were presented at the Institute for Advanced Physics’s seventh annual conference held at the University of Notre Dame in July 2009. These papers provide foundational material for the second textbook in the PFR series, Physics for Realists: Electricity and Magnetism.*

*The journal is currently available only to IAP members working on the PFR:E&M textbook. It will be available for wider distribution after PFR:E&M is published.*

On August 17<sup>th</sup>, the **St. Louis, Missouri chapter of Legatus** invited **Dr. Anthony Rizzi** to spend the evening teaching them about the key problem that attacks our culture. Dr. Rizzi gave a talk to members titled: *Science “To Serve Man,” A Parable from the Twilight Zone* with a subtitle: *How a Misunderstanding of Science is Creating a Culture of Death*. The good news is that science is a wonderful thing, but which Catholics do have to re-own. The mission of Legatus is to study, live and spread the Faith in members’ business, professional and personal lives. Legatus currently provides service to over 1,800 businesses in 60 chapters across the United States, and internationally on three continents.

**The Institute for Advanced Physics**

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## *A Reflection on the Meaning of This Year's Conference*

*by Daniel Welch, Wofford University, Professor and Chairman of the Department of Physics*



While working in physics a small voice sometimes urges deeper attention, an idea that seems, somehow, too valuable to dismiss. Lacking time, I shelve the ideas in that place of hope reserved for such moments. Occasionally I will pull an idea from the shelves, follow it, make some progress, then put it back on its shelf for more attention later. Few get that final touch that removes them permanently; the shelves fill faster than they empty. One never expects to answer all questions, of course, but the filling begins to feel disquietingly systematic, a sense that I am missing something fundamental.

During the Institute for Advanced Physics Summer Conference this summer [2010] the very physical view produced a clarity that deeply startled me. I know that I have been making progress with the philosophical basis, but this was an abrupt step upward. It was a direct experience of the deep beauty of physics that drives both research and teaching. During those moments this summer, important things were pulled from my mental shelves and placed directly into my mainstream. The rare experience multiplied!

The work of the Institute has become essential to my own life's work. Working in company with good men who are also good physicists exceeds in fullness anything I have experienced before. This is what Physics should be, must be.

### *National Catholic Register*

*More than  $E=MC^2$ : Top Physicists Combine  
Science with Natural Philosophy*

The May 17th issue of **The National Catholic Register** featured an article on **Physics for Realists**, Dr. Murray Daw, Adjunct Professor of the IAP and Bowen Professor of Physics at Clemson University in South Carolina, and Dr. Anthony Rizzi, IAP founder and Director.

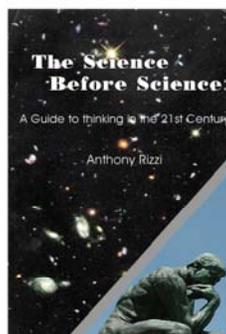
"Catholic colleges currently do not have the tools to teach science in a way that builds and supports the foundation, the preambula fidei, needed for the Catholic faith," said Daw. "Scientists understand the math but could be embarrassed because they do not understand the deep-seated principles of reality." Now with *Physics for Realists*, Daw says, "I have something to offer [students] that I didn't have before. Deeper understanding leads to a new and much better way of teaching physics; it makes it more digestible."

### **Permanent Catalog Course added at Clemson University**

**PHYS 280 Physics and Reality**

**Text: *The Science Before Science*  
and other IAP materials**

"Non-technical study of the content and meaning of modern physics. Begins with first-principles of physics. Evaluates concepts of substance, matter, locomotion, atomization, fields, space, time, randomness. Includes quantum mechanics, Bells Theorem, theory of relativity, Gödel's Theorem. Intended for a broad college audience."



Order your copy of Dr. Rizzi's *The Science Before Science: A Guide to Thinking in the 21<sup>st</sup> Century* online on Amazon or by calling our distributor at 888-519-5121 select option 1