

Fall 2009



# THE INSTITUTE FOR ADVANCED PHYSICS

# The Institute News

by J. Clifton Hill, CSSp, PhD

- **Seventh Annual Summer Conference**
- **Auburn, Charleston Invite Dr. Daw to Lecture on *Physics for Realists***
- **AAPT Journal Praises *The Science before Science, Physics for Realists***
- **Dr. Haller Develops Software for *PFR Volume II***

## Seventh Annual Conference at Notre Dame

The seventh annual summer conference of IAP, held at the University of Notre Dame, July 22-25, focused for the first time on the upcoming **second volume** of *Physics for Realists* which treats electricity and magnetism (E & M). The IAP certified members met to continue their work together on the Institute's major long-term project of writing a series of undergraduate-level physics textbooks. They hope to make the importance of science more widely and deeply appreciated.

The importance of the project cannot be overstated. The current generation of physicists, including the conference participants, was formed in the current intellectual miasma that blinds our civilization to the truth that modern science is *not* the first or the last word on the natural world, but that science depends on a broader *philosophy of nature* for its proper understanding. The goals we are advancing every day include: 1) researching and discovering the full physical meaning of modern empiriometric science, 2) forming some of the present and next generation of scientists (today's students) in this realistic conception of nature that doesn't permanently abstract away obvious realities, like the fact that things have an essential nature. Having been raised in this integral vision, the young scientists will be equipped to reclaim the universities and our civilization for the philosophical sanity that gave them birth. Until the intellectual base of our culture, its physics, is



From left to right, Dr. Dan Welch, Fr. Neal Nichols, Dr. Joe Haller, Dr. Anthony Rizzi, Dr. Ken Klenk, Dr. Murray Daw, Fr. Clifton Hill, Dr. Joe Martin; *conference photos courtesy of Mrs. Cecilia Klenk*

reintegrated in this way, physics will not connect with the common sense things we know first, and our culture will continue its slide into a mechanistic and cold world.

In developing a fully physical understanding of electricity and magnetism, it is also necessary to do ontological research on more recent developments in empiriometric physics. Maxwell's equations, for example, the presentation and explanation of which form the major part of the text, were developed almost 150 years ago. A fully physical understanding of E&M must be (analogically) generic enough to bear specialization by the subsequent developments in the field. By incorporating the advanced material, we gain a better understanding of E&M and build a more complete root structure for the textbook. Furthermore, it also allows us to fill the text with material that lays a path to, and whets the appetite of students for, the advanced material.

**Dr. Anthony Rizzi**, an MIT and Princeton physics graduate and IAP Director, is providing the physics and philosophical leadership for this historic project. He presented papers on Fields in general, Static Electric Fields, Induction, Displacement Current, Relativity and Fields, and Propagation and Maxwell's Equations. He followed this with a demonstration of the radio transmitter that students will be able to understand and build as a 'hands-on' project of the electricity and magnetism course.

**Dr. Murray Daw**, IAP Adjunct Professor, shared his experience and his enthusiasm in using *PFR—Mechanics* in the classroom at Clemson University.

**Fr. Clifton Hill**, IAP Physics Professor, presented historical and biographical information on figures

prominent in the development of E & M, which will form the basis for the history "boxes" appearing throughout the text.

**Dr. Joe Haller**, IAP Physics Professor, discussed software he has been developing for visualizing the time development of fields, a feature very useful in understanding the propagation of electric and magnetic fields.



A certificate of recognition was given to **Fr. Neal Nichols**. He has been with IAP for six years and continues to be very dedicated to its mission, providing for members' spiritual needs and participating in many ways.



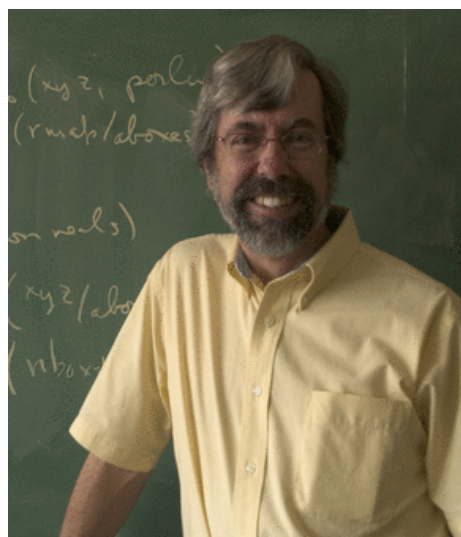
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The participants split into breakout groups to work on formulating homework problems and answers in the above areas which could be included in the text. In addition, the groups discussed what information should go inside the front and back covers of the new textbook and suggested possibilities for the format of the cover itself.

After Thursday's dinner the entire group gathered for an experiment to measure the electric field above the earth. Helium balloons went over 150 feet into the air. IAP activities on the Notre Dame field attracted the attention of and questions from the campus students as the experiment raised into the air.

## Auburn and Charleston Invite Dr. Daw to Speak

**Dr. Murray Daw**, IAP Adjunct Professor and Bowen Professor of Physics at Clemson University, will give Colloquia on *Physics for Realists* at **Auburn University** on October 9 and at the **College of Charleston** on October 22. Dr. Daw has taught the ground-breaking material in the text in the classroom and will introduce that material to fellow physicists and other interested faculty members.



## Dr. Haller Develops Software for PFR Vol. II

**Dr. Joe Haller**, IAP Professor of Physics, has been working in Nevada on various IAP projects including software development which will assist in visualizing the time development of electric and magnetic fields. It is a first-of-its-kind visualization that is a result of IAP original research and will greatly enhance the realistic approach of the second volume of *Physics for Realists: Electricity and Magnetism*. He also travels to the IAP main

office here in Baton Rouge to collaborate in person and to discuss much of the material now being prepared for this textbook.



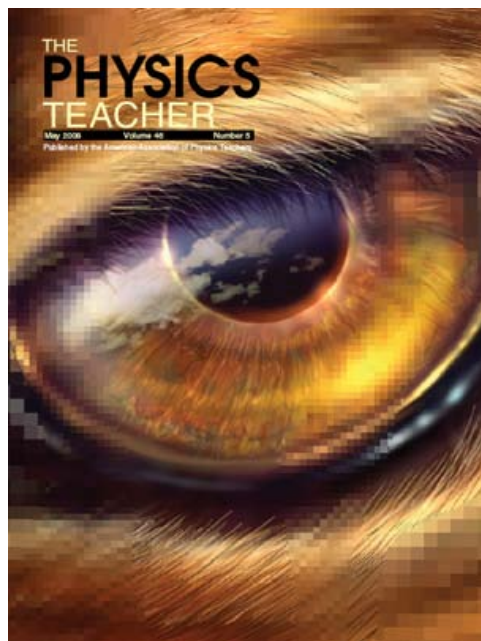


## Praise for *The Science before Science* and *Physics for Realists*

Two books authored by Dr. Anthony Rizzi, IAP Director, and published by the Institute received nothing but accolades in the Book Review section of the May 2009 issue of *The Physics Teacher*, a widely-circulated journal published by the **American Association of Physics Teachers (AAPT)**. The reviewer, **Dr. John L. Hubisz**, *The Physics Teacher* column editor, of the Department of Physics at North Carolina State University, devotes nearly two full pages to his comments on *The Science before Science* and *Physics for Realists*. He concludes his lengthy remarks on *SBS* by stating that "...I believe [Dr. Rizzi] wants us all to love (filia) wisdom (sophia). I strongly recommend this book."

In reviewing the text *Physics for Realists*, he notices early on that "it presents a significantly different approach than others (introductory physics textbooks)" The reviewer notes some of the unique features of the textbook, among which are its common-sense approach that maintains contact with one's pre-scientific experience, its unifying theme that applies the principles presented: the manned trip to Mars, its

historical notes that show the continuity in the development of physics, its unique presentation of Special Relativity, and free download of *Interactive Physics* software. He concludes "Rizzi has done an excellent job and I recommend that you experience this text..." One recent purchaser of the book said that he was led to order the book because it was "reviewed to high praise" in *The Physics Teacher*.



*I am writing to express my complete and enthusiastic support for the work of the Institute for Advanced Physics. The people involved are knowledgeable and even exceptional in their fields... I can testify that the Institute's work is crucial to reforming our culture. Misunderstanding of science is the key source of the confusion in the humanities and the larger culture. Physics in the broad sense is the foundation for all of our knowing.*

**Ralph McInerny**

Michael P. Grace Professor of Medieval Studies and  
Professor of Philosophy, University of Notre Dame,  
member of the President's Counsel for the Humanities under GW Bush