



THE INSTITUTE FOR ADVANCED PHYSICS

The Institute News

- **Sixth Annual Summer Conference**
- **IAP Welcomes Two New Certified Members**
- **Dr. Haller, Fr. Hill Now Faculty of the IAP**
- **February 2009 Teachers Conference**
- **Solutions Manual for *Physics for Realists* Now Available**

Teaching *Physics for Realists*

Fresh bright copies of the new text *Physics for Realists: Modern Physics with a Common Sense Grounding* were much in evidence as members and teachers gathered for the Institute's sixth annual Summer Conference on the campus of the University of Notre Dame, July 16-19.

The attractive book is the product of years of research and, it is hoped, will be a major vehicle for grounding young physicists in a realist philosophic approach as they learn Newtonian physics and are introduced to the study of special relativity.

This year's conference featured a unique format. On the first full day, Thursday, IAP members were treated to a chapter-by-chapter review of the book by certified members, with opportunity for questions and discussion. Presenters stressed the excitement and importance of the text's unique approach.



IAP members and faculty from left to right: Mr. Rado Krevs, Fr. Neal Nichols, Dr. Gino Sturino, Dr. Joe Haller, Dr. Anthony Rizzi, Dr. Murray Daw, Dr. Ralph McInerny, Fr. Cliff Hill, Dr. Dan Welch, and Dr. Ken Klenk.

Friday's sessions was directed at physics professors. It included tutorials on the panoply of new material in the text and break out sessions to give teachers a chance to personally tackle and present the material. One might compare the session to a workshop on "Teaching Introductory Physics", but there was a difference here. Much new material must be digested and teachers must be prepared to relate the modern physics to common-sense questions about the deeper reasons things behave as they do.

In the afternoon, in break-out sessions into smaller groups, the teachers were given the opportunity to role-play: acting now as teacher and then as student. Many reported that this technique led to greater understanding and insight into the importance of the material and the significant differences between this text and the texts in general use today.

The text walks the students from their common sense to the full mathematical treatment. In the *Physics for Realists* (PFR) textbook, the qualitative comes first; then we introduce the students to the full quantitative theory so they can really understand the math. This is the first physics textbook *ever* that grounds Newtonian physics in common sense starting points given by the senses (note: Newtonian physics has been around for 300 years). PFR deepens our understanding of physics as well as attracts, by its simple starting point, more students to physics.

New Certified Members Welcomed



Dr. Rizzi presents Dr. Dan Welch his certification

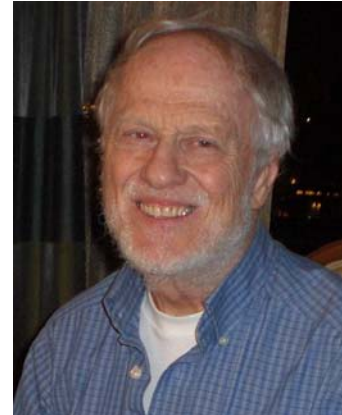
Dan Welch did his undergraduate work in physics at the University of Louisiana at Lafayette and earned his Ph.D. at Clemson University in South Carolina, specializing in gravitational radiation according to general relativity.

While in the academic community, for 9 years he maintained a consulting business that produced hardware and software for industrial control systems. This resulted in a dual appointment, both to the physics department and to the computer science department at Wofford College, a private undergraduate college in Spartanburg, SC with Methodist affiliation.

Dr. Welch has worked at planetariums as program writer and performer and has worked with gifted students and middle school teachers in astronomy.

He has many times expressed his deep appreciation for the knowledge he has been given by the IAP.

He is presently chairman of the Physics Department at Wofford College.



Joseph P. Martin received his bachelor's degree in physics at St Joseph's University (formerly St. Joseph's College) in Philadelphia on an athletic scholarship. After receiving a Ph.D. in nuclear physics from the University of Pittsburgh in 1960, he pursued a 46-year-long career that led from experimental nuclear physics at Brookhaven National lab to space science instrument development at Martin Marietta, Lockheed Martin, and N-Science.

During those years he had a parallel athletic activity, competing in 10k running races, masters swimming, national triathlon championships, and bicycle commuting and fundraising tours. He was also involved in volunteer service activities including fair housing, lobbying for the hungry, and St. Vincent de Paul Society work with the needy.

Instrumentation developed by Dr. Martin has successfully made measurements in space and planetary missions including those to Mars and Jupiter, as well as some in earth orbit. He has held several scientific positions including that of Chief Scientist of the Planetary Science Laboratory at Lockheed Martin. He is presently working on space-based instrumentation at N-Science.

Dr. Martin found the material of the certification completely new, though parts of it had been presented to him in his undergraduate years. This is common and is to be expected given how little known the science before science is and that it is especially hard for those with a formation and bent toward the modern (empiricist) sciences.

Dr. Haller and Fr. Hill named to Faculty of the IAP

Dr. Joe Haller has a Ph.D. in astronomy from the University of Arizona (1992) and subsequently worked for five years as a research associate in the U of A theoretical astrophysics group. His research involved infrared studies of the Galactic Center stellar population, the massive black hole candidate Sgr A* ("Saj-A-star"), and theoretical studies of stellar dynamical systems. He has been an adjunct astronomy lecturer for Pima County Community College and the Community College of Southern Nevada as well as an undergraduate physics lecturer and laboratory instructor at the University of Arizona.

Theology, philosophy, and natural science have long been favorite interests. As a graduate student he helped co-found the St. Albert the Great Forum on Theology and Science at the University of Arizona St. Thomas More Newman Center which received a Campus Ministry Award from the National Conference of Catholic Bishops in 2001. He is an avid reader and collector of Aristotle and St. Thomas Aquinas.

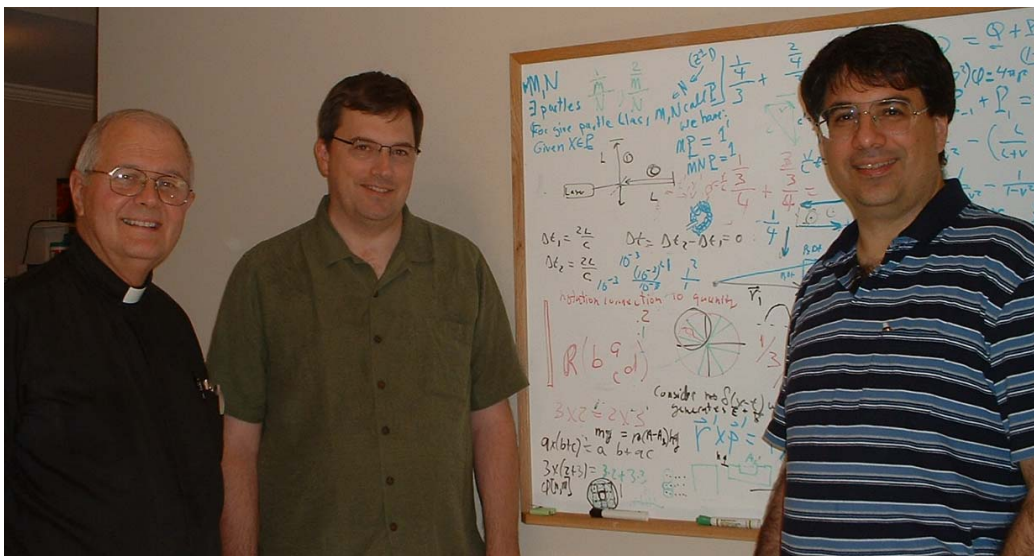
Upon moving to Las Vegas, Nevada in the late nineties he worked in private industry as a corporate web site and application developer. He has done GPS data integration, risk analysis, and economic Monte Carlo modeling.

He has now been appointed to the position of Professor of Physics at the Institute for Advanced Physics, which he has currently committed to at a half time level. He and his wife Karen have two children.

Fr. Cliff Hill, PhD, has been appointed as full time Professor of Physics at the Institute for Advanced Physics.

He graduated from Louisiana State University in May of 1958 (B.S., Physics) and entered the Spiritan Novitiate [Holy Ghost Fathers] in August. He was encouraged to pursue his study of physics even while in the seminary and obtained a M.S in Physics from Catholic University in 1963. After ordination, he attended Rice University, obtaining his Ph.D. (Atomic Physics) in 1971. He spent the next thirty years teaching physics at Duquesne University in Pittsburgh, interrupted only by a year of teaching overseas (Taiwan), sabbaticals, and summers doing research at a government laboratory in Orlando, Florida.

Though educated before Vatican II in Thomism, he, like nearly all others in our culture, found himself with no real digestion of basic concepts such as substance, accident and the deep, but common sense, Thomist understanding of change. Indeed, little of basic Thomism made any sense to him before going through the certification process. He points out he was able to see it because Dr. Rizzi brought in physics, helping him see how modern physics presupposes and illuminates Thomism. He is happy to now see how philosophy deepens his physics knowledge.



At a gathering at the Institute for Advanced Physics on October 2, 2008, certified members Fr. Cliff Hill and Dr. Joe Haller were named Faculty members of the Institute. Dr. Haller had been working with Dr. Rizzi to put finishing touches on the PFR Solutions Manual and to develop computer programs dealing with electricity and magnetism that will be used in Volume 2 of *Physics for Realists*. Fr. Hill's recent projects include editing the PFR Solutions Manual.

The Institute for Advanced Physics presents

Physics for Realists

Modern Physics with a Common Sense Grounding

College Physics Teachers Conference

Saturday, February 28, 2009

at Saint Joseph's University, Philadelphia, PA

IAP faculty give you the tools to radically improve your and your students' understanding using *Physics for Realists*, a ground-breaking textbook which:

1. Integrates Newtonian physics with its **philosophical foundations** giving it its full breadth.
2. Reveals special relativity in its full breadth, putting it in light of philosophical first principles.
3. Makes use of the new understanding as the author develops, for the first time, a **common sense** pedagogy which takes students from their immediate sense experience to the heights of modern Newtonian physics.
4. Lays out the full **evolution of the ideas of physics**, showing the robust connection of medieval science with the modern science.
5. Has a unifying practical theme so that the philosophical, modern, theoretical and historical unities are complemented by a unity of practice. As the student learns principles, he **solves the manned mission to Mars** which President Bush called the US to complete by 2030.
6. Grounds the required mathematics explicitly in common sense for the first time.
7. Comes with **top flight software**, *Interactive Physics*TM, providing a hands-on approach to deepen the reader's conceptual understanding.

For registration information contact Susan at:

(225) 667-0233

info@iapweb.org

PFR Solutions Manual Now Available to Teachers

A manual containing detailed solutions to most of the end-of-chapter problems in *Physics for Realists* is now available for purchase by teachers and professors who have purchased the textbook. The cost is \$45 plus s/h. Teachers and professors **MUST** first contact IAP by email for approval to purchase the solutions manual on IAP's web store. Failure to obtain email approval prior to web site purchase will result in a partial refund (a \$7 processing fee will be charged). To purchase the *PFR Mechanics Solutions Manual* please send your name, title, and identify your teaching institution in an email to: Info@iapweb.org.

