



THE INSTITUTE FOR ADVANCED PHYSICS

The Institute News

- Physics for Realists Algebra Guide
- New Members: Doug Eckert, David Welch, Fletcher Williams
- Volunteers: Krish Ramanathan, Giuseppe Rizzi
- Teacher workshop to help launch new school
- New IAP online store
- South Carolina members' picnic

Physics for Realists Algebra Guide

by Anthony DiCarlo



Algebra Guide group members Maikel Garcia (*left*), Randy Nichols (*center back*), Frank Camacho (*right center*), and group leader Anthony DiCarlo (*right*)

(Photo taken 2017 conference)

The Institute for Advanced Physics (IAP) Algebra Guide group is nearing the completion of the first cut of the Algebra Guide, which will make Dr. Rizzi's groundbreaking textbook, *Physics for Realists: Mechanics*, accessible to algebra-level students. This resource will have a huge impact once completed because it will allow *Physics for Realists: Mechanics* to be used in all high schools around the nation.

The Algebra Guide group members **Anthony DiCarlo, Maikel Garcia, Frank Camacho,** and **Randy Nichols** recently welcomed **Fletcher Williams**, a new IAP Associate Member, to the group to help vet the material as he uses the Guide in his teaching at **Our Lady of Mercy Catholic High School in Atlanta**. The Algebra Guide is also being used by Anthony DiCarlo to teach home-school students as part of the vetting process.

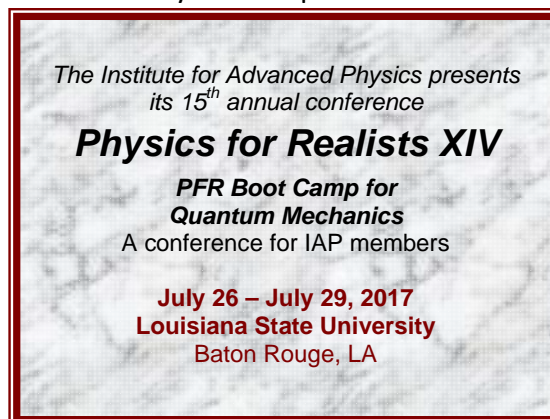
David Welch, Certified Member



David Welch is a Senior Scientist (retired), now Visiting Scientist, in the Department of Condensed Matter Physics and Materials Science at **Brookhaven National Laboratory** (BNL) and an Adjunct Professor in the Department of Materials Science and Engineering, as well as a member of the Mineral Physics Institute, at **Stony Brook University** and an Adjunct Professor in the Department of Physics at **Clemson University**. The son of a Presbyterian minister, he was born in Richmond, VA and, because of World War II and the custom of the Presbyterian Church that its ministers only spend a few years in each pastorate, he grew up in numerous small towns in Arkansas, Texas, Louisiana, and Tennessee. He received his B.S. degree in Metallurgical Engineering at the **University of Tennessee** (Knoxville) in 1960, S.M. degree in Physical Metallurgy at **MIT** in 1962, and Ph.D. degree in Theoretical Materials Science at the Laboratory for Research on the Structure of Matter at the **University of Pennsylvania** in 1964. He was a NATO postdoctoral fellow at the **United Kingdom Atomic Energy Research Establishment** at Harwell, England in 1965, after which he joined the faculty of **Princeton**

University as Assistant Professor of Solid State Sciences from 1966 to 1972, when he became a member of the scientific staff of BNL in Long Island, New York until his retirement in 2006. At BNL he was a member of the scientific staff, group leader, associate chair, and founding chair of the Materials Science Department, which later became the Department of Condensed Matter Physics and Materials Science.

Early in his career, Dr. Welch studied the crystallographic structure of materials using X-ray scattering methods. After receiving his master's degree and while working for the summer at the **Research Institute for Advanced Studies** (RIAS) in Baltimore, MD, and while awaiting the renovation of the x-ray lab, his supervisor gave him some very puzzling data to analyze until the diffractometer was up and running. He was successful in unraveling the puzzling data and consequently decided that theoretical work, rather than experiment, was his true calling. He returned to graduate school at the newly formed Laboratory for Research on the Structure of Matter, an interdisciplinary program jointly between the Physics, Metallurgy, and Chemistry departments at the University of Pennsylvania. He became a theorist and developed a taste for interdisciplinary research at the boundaries between theory and experiment and at the



boundaries of Materials Science and Condensed Matter Physics. He has published research on materials as disparate as mammalian bones, the crust of pulsars, and superconducting magnets. The unifying theme has always been the relationships between the structure of matter and its physical properties, with a focus on thermodynamics and mechanics. At present, his research is focused on the properties of materials at high pressures and temperatures and how this manifests itself in the behavior of the interior of the Earth.

He got to know **Dr. Anthony Rizzi**, Director of IAP, in reviewing a quantum mechanics

manuscript Rizzi was writing. Dr. Welch was introduced to the general work of the **Institute for Advanced Physics (IAP)** through **Dr. Murray Daw**, Bowen Prof. of Physics Clemson University and IAP Adjunct Faculty, whom he has known for many years through their mutual interests in the physics of materials. Dr. Daw introduced Dr. Welch to Rizzi's *Science Before Science: A Guide to Thinking in the 21st Century*, and because of Dr. Welch's existing interests in the history and philosophy of science, as well his religious upbringing, the works of Aristotle, Thomas Aquinas, and Dr. Rizzi found fertile ground in his mind for further study and application.

Doug Eckert, Associate Member



Doug Eckert attended the **International Secondary School in Suva, Fiji Islands**, served as Head Prefect and secured the highest marks on the **New Zealand University Entrance Exam**. Doug is a graduate of **The University of Virginia** and **The University of Virginia School of Law** (B.A. International Relations 1987, J.D. 1993), and in between worked for three years on Capitol Hill as a legislative assistant to **Senator Trent Lott**.

Doug practiced law in Birmingham, Alabama for the **Bradley, Arant law firm** for a dozen years, being elected to partnership and to the

firm's Executive Committee. He led the firm's International practice. In 2005, Doug joined **Hoar Construction LLC** as a partner, and serves as Executive Vice President responsible for legal, risk management, human resources, marketing and sales. Hoar is a national commercial general contractor that does work for clients such as Apple, Disney, Greystar, the University of Alabama and Notre Dame.

Doug has served on the boards of several children's charities in Birmingham, Alabama, including Magic Moments, The Tum Tum Tree Foundation, and Children's Harbor. He is a member of the Equestrian Order of the Holy Sepulcher of Jerusalem, attends the Cathedral of St. Paul, and is active with local Catholic charities Holy Family Cristo Rey and St. Rose Academy.

Doug is married to the former **Kathryn Howard** of Enterprise, Alabama and has two daughters, Mary Olivia and Sophie, both of whom attend the University of Virginia. Mr. and Mrs. Eckert are friends of IAP friend **Noah Lett**, EWTN theology department.

Fletcher Williams, Associate Member



Fletcher Williams recently graduated from **Clemson University** in 2016 and obtained a B.S. in Physics with a minor in mathematics. Immediately following graduation, he began the Teaching Fellows program with the **Alliance for Catholic Education (ACE)** at **The University of Notre Dame**.

He has spent the past year teaching high school math and science classes in Atlanta, GA as a part of the ACE program. He will teach another year at the same school while pursuing graduate coursework, completing his M.Ed. from Notre Dame in 2018.

Among other interests, Fletcher is an avid reader. Through study of the Scriptures, early Church Fathers, and modern authors like C.S. Lewis and G.K. Chesterton, he was led to the Catholic Church and converted in 2014. Since then, he has worked to deepen his knowledge of both theology and science and enjoys sharing that with family, friends, and students.

IAP shares various resources for high school and college teachers and students at:

www.iapweb.org/resources.htm

Krish Ramanathan, Volunteer Member

Srikrishna Ramanathan came to attend university in the US from India in 2004 on a tennis scholarship. After earning his undergraduate degree in Business Management, he started working in the distribution industry and is currently employed as a Business Process Analyst. He found out about the Institute for Advanced Physics through **Mr. Anthony DiCarlo**, IAP Associate Member.

Thanks to the IAP and Dr. Rizzi's work, he has learnt many things; some of which include:

- 1) Everything he knows came through the senses
- 2) The distinction between knowledge vs. belief
- 3) A better understanding of the real meaning of science (and the distinction between big physics and modern physics) and its purpose.

He will continue to contribute to the Institute for Advanced Physics through work, prayers, and financial contributions.

Check out new resources at IAP's
online magazine



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

Read this article and more at:

www.iapweb.org/iapmagazine.htm

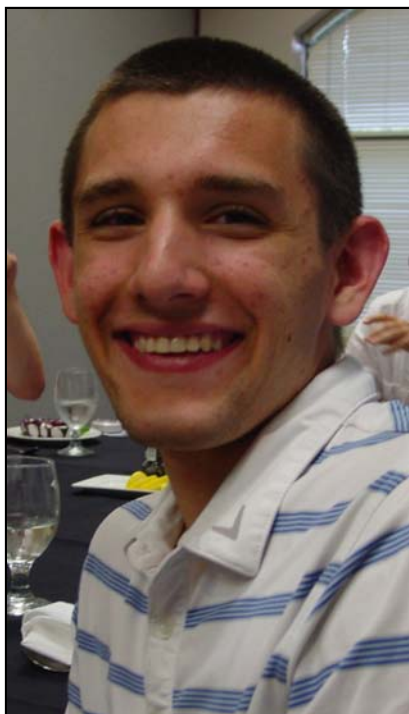
Teacher workshop to help launch new school

The Institute for Advanced Physics (IAP) gave a teacher's workshop for members of **Summit Academy in Virginia** in July 2016 (last year). Summit Academy was preparing for its first year, and the headmaster reached out to the IAP for help in forming the curriculum of the school after having the IAP recommended to him by a friend. The workshop was led by **Dr. Murray Daw**, IAP Faculty, and **Anthony DiCarlo**, IAP Associate Member. **Randy Nichols**, IAP Associate Member, assisted at the workshop as well. The members of the Summit Academy that participated in the workshop were **Julian Malcolm** (Headmaster), **Patrick Looby** (Dean of Academics), **Peter Orłowski** (Teacher), **John Piescik** (Teacher), and **Kathryn Piescik** (Teacher).

The five day workshop focused on the content of *A Kid's Introduction to Physics (and Beyond)* and the *Physics for First Communion* DVD and how to integrate that material into the school curriculum. Participants attended daily lectures, turned in homework, and asked good questions. At the end of the workshop, one of the participants commented to Mr. DiCarlo that he could not have hoped for a better start with this new school than what he got in the workshop.

To schedule a teacher workshop at your school, contact Anthony DiCarlo at info@iapweb.org or call (225) 667-0233.

Brand New IAP Online Store Created by Giuseppe Rizzi, Volunteer Member



A new Institute for Advanced Physics online store (iapweb.org/store) was created over the summer. It simplifies the ordering process, improves layout, and allows the ability for future customizations as needed. The new store went active on June 18th. Now, the PayPal checkout page can usually be reached in as little as four clicks. Options for order modifications are easily accessible, and one can immediately see all relevant items in his cart from all pages. For most customers, there is no need to make any special adjustments to their shipping besides simply entering their address.

This store also automates a major part of IAP's inventory process, among other automations, giving IAP workers and volunteers more time to focus on their important work.

Giuseppe Rizzi, IAP volunteer member, built the new store website. As a computer technician, he works on the web site, networking and creating software to streamline tasks. He is a Louisiana 2016 National Merit Scholar who is currently a sophomore majoring in Electrical Engineering at **Texas A&M University**. His TAMU robotics team placed 5th out of 500 freshman teams in the spring 2017 TAMU Engineering Showcase.

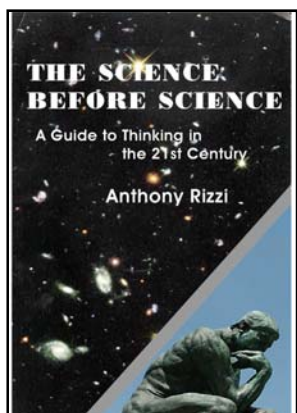
South Carolina Members' Labor Day Picnic

Several Institute for Advanced Physics members and their families gathered together on Memorial Day weekend for food and fellowship at Cleveland Park in Greenville, SC. They enjoyed hamburgers and great conversation. Topics discussed included the upcoming IAP summer conference, the challenges faced by teachers in a modern educational setting, good books/encyclicals to read, and good movies to watch, among other things. Maria (4-years-old) and Lucia (2-years-old) DiCarlo showed off their knowledge of *A Kid's Introduction to Physics and Beyond* by reciting their 9 categories of properties (which they learned by watching IAP's *Physics for First Communion* DVD series). It was an enjoyable and uplifting time for the whole family!

Participating families: Ramanathan, Sulyi, Williams, Welch, Lejeune, Daw, and DiCarlo



Science Before Science Study Group



Anthony DiCarlo is leading a group study of *The Science before Science: a Guide to the Thinking in the 21st Century* (SBS) by Dr. Anthony Rizzi in Greenville, SC. The group (about 7 men) meets most Saturday mornings to discuss the reading and its application in their daily lives. This group of men has been doing book studies together for some time in an attempt to better themselves and their community. They recently started reading SBS and contacted Mr. DiCarlo, recruiting him to attend and lead the discussions. The men are very excited about what they are learning and thankful to have the fundamental truths found in SBS explained to them for the first time. 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/](https://www.smile.amazon.com/) and choose the Institute for Advanced Physics as your charity!