

SPOTLIGHT ON “HIDDEN PHYSICISTS”

PATRICIA ALIREZA, UNIVERSITY OF CAMBRIDGE, LONDON, ENGLAND

“I am originally Mexican but I did my BA in physics in Occidental College, CA, MS in physics in UCLA, CA, and my PhD in physics in the University of Cambridge in England. I am still in Cambridge working as a research associate at the Cavendish Laboratory in the Low Temperature Physics group. I do research at high pressures, low temperatures, on strongly correlated systems. I love my work and plan to continue this kind of research for the foreseeable future.”

Patricia Lebre Alireza
pla20@cam.ac.uk

BRIAN COPPA, THIN-FILM PROCESS DEVELOPMENT ENGINEER, BOISE, ID

“I am a hidden physicist, originally from Cumberland, MD. In 1999, I graduated with a BS in physics and economics minor from the University

of Arizona (U of A) and completed my graduate studies in materials science and engineering at North Carolina State University (NCSU) in Raleigh, NC, in the summer of 2003. As an undergraduate at the U of A, I was a four-year SPS member, one-year SPS and Sigma Pi Sigma president, and an Associate Zone Councilor. In the fall of 2001, I received a Master’s in materials science before completing my PhD dissertation entitled, ‘Electrical, Chemical, and Structural Characterization of Au Schottky Contacts on Remote Plasma-Treated n-Type ZnO{0001},’ under the direction of Dr. Robert F. Davis, advisor, and Dr. Robert J. Nemanich, co-advisor. My dissertation research dealing with gold Schottky diodes on zinc oxide wafers has been published in *Applied Physics Letters* and the *Journal of Applied Physics*, in addition to recognition in the *MRS Bulletin*. Also, I have pending patents for the ZnO in situ cleaning process and Schottky contact fabrica-

tion, which may be utilized for light-emitting devices, UV photodetectors, and high-frequency transistors. My PhD minor included a high-technology entrepreneurship program, and, concurrently, I served as the treasurer and president of the NCSU Materials Research Society.

The rigorous nature of a physics program, including classes and undergraduate research, was the ideal preparation for completing a PhD in a related engineering field. My research lab at NCSU was even located in the Physics Department. However, I found that my economics and business background was attractive while seeking employment in the semiconductor industry.

I am currently working as a thin-film process development engineer with Micron Technology, Inc. in Boise, ID. As a member of the Strategic Process Development Group, I am focused on developing next-generation memory devices for computers, cell phones, and

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“Hidden Physicists”

One of Sigma Pi Sigma’s greatest assets is its diversity. Stemming from a common interest in and aptitude for physics, our members have gone on to pursue a multitude of interesting and unusual career paths. Now, more than ever, we seek to draw on the wisdom and experience of our alumni.

With help from the American Institute of Physics, Sigma Pi Sigma is attempting to locate the names and whereabouts of people with BS, MS, or PhD degrees in physics whose careers have taken them away from the “traditional” physics community. We ask for your help in finding the universe of people who are trained in physics—what they do and where they are.

As the physics community faces new challenges and opportunities, we would like to engage these “hidden physicists” in the fellowship of physicists. Therefore, if you work outside the traditional physics community, please provide us with the following information. Also, if you know of others in similar situations, please encourage them to contact us. Several responses will be selected for publication in each issue of *Radiations*.

Material for publication must be received by February 15 for the spring issue and by August 15 for the fall issue. ♦

Name _____ Position _____

Company _____

Address _____

Telephone _____ Fax _____ E-mail _____

Comments _____

Send to: Sigma Pi Sigma, American Institute of Physics, One Physics Ellipse, College Park, MD 20740
Telephone: (301) 209-3007 ♦ Fax: (301) 209-0839 ♦ E-mail: sps@aip.org.

digital cameras.”

Contact:

brianc@catholicexchange.com

GAUTAM MALHOTRA, MD,
PHYSICAL MEDICINE &
REHABILITATION, NJ

“My name is Gautam Malhotra. Aside from double minoring in biology and music, I earned my BS in physics at Rutgers College in New Brunswick, NJ. My diverse background actually made me uniquely qualified for a biophysics-music research project at the Nucleic Acid Database. After a year of work, I demonstrated that the physical properties of nucleic acid sequences can be accurately represented sonically (please visit: <http://ndbserver.rutgers.edu/atlas/music/proj.2.html>). After that I did my four years of hard time at the New Jersey Medical School. I am currently at the tail end of my residency training in the specialty of Physical Medicine & Rehabilitation. Frankly, physics was very attractive to me because asking ‘why’ was a core requirement for its study. No matter how fundamental the concepts became, everything as a physicist was fair game for study. One had to have the courage to ask “why” and then the mental discipline to work through the problem-solving process.

Although I have forgotten the many complicated equations derived during my college years, I retained my training as a problem-solver and thinker. After being surrounded by fellow physics majors, one takes for granted the ‘thinking’ training that a physics degree cultivates. My need to discover ‘why’ initially became a crutch for me in medical school where there is a need to memorize volumes of information with little time to process it. However, seeking the derivations of medical knowledge has served me very well and provided a stable foundation for a career in evidence-based medicine. More specifically, my chosen subspecialty requires an understanding of gait mechanics, electricity, and

instrumentation when dealing with neuromusculoskeletal disorders and electrodiagnosis (electromyography, evoked potential testing, nerve conduction studies).

Hopefully, my patients will be the ones to benefit most from my physics training, for which I am ever grateful.”

DR. RONALD I. MILLER,
PHYSICIST, DEFENSIVE SYSTEMS
OFFICE, REDSTONE ARSENAL, AL

“Dr. Ronald I. Miller is employed as a physicist and Senior Intelligence Officer at the Defense Intelligence Agency’s Missile and Space Intelligence Center (DIA/MSIC) at Redstone Arsenal, AL, and also as the DIA Member of the Directed Energy Weapons Subcommittee (DEWS) of the US Intelligence Community in Washington, DC. He chaired the DEWS from 1990 through 1998. He has been on the DEW staff at MSIC for 27 years, and prior to that was with the Boeing Aerospace Company for seven years. He is a 1965 graduate of Austin Peay State University with degrees in mathematics and physics, and he holds an MS degree in physics from Clemson University, and a Doctor of Science degree in physics from Southeastern Institute of Technology. Dr. Miller has taught physics on a part-time basis at four southern universities.

While working at Boeing, Dr. Miller made contributions to NASA research programs studying the solidification of materials in the micro-gravity environment of space. This work involved experiments on Skylab, the Apollo-Soyuz mission, and various sub-orbital rocket flights. It laid the foundation for materials-science-in-space projects flying on the Space Station today.

At MSIC, Dr. Miller has been responsible for the management and direction of scientific and technical analyses of foreign DEW systems for the air defense, ASAT, and ballistic missile defense missions. He is a

member of the American Physical Society (APS), the Directed Energy Professional Society, and an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA); and serves as an advisor to the Departments of Defense, State, and Energy, and to Congress on foreign DEW systems and technology. He was awarded the National Intelligence Medal in 1999,

and was inducted into the Phi Kappa Phi Academic Hall of Fame in 2004.”

CHRIS THROCKMORTON, FCAS,
MAAA, SR. VP & CHIEF
ACTUARY, FAIRMONT SPECIALTY
GROUP, HOUSTON, TX

“I belong to the growing number of ‘hidden physicists’ working in financial disciplines. I received my BS in physics (and a BS in math) from the University of Texas at Austin in 1992. The training I received in physics developed the problem solving techniques and persistence with challenging problems that I now use to work as an actuary. I’m Chief Actuary for a company specializing in property and casualty insurance. As an actuary, I’m responsible for estimating the ultimate future cost of insurance claims (and related cash flows). This work involves identifying and quantifying trends from raw data, developing hypotheses about future amounts, and testing (and frequently rejecting) these hypotheses on the basis of future data.”

