Greek American Scientists

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SPONSORED BY THE PARLIAMENT OF THE HELLENIC REPUBLIC, DIMITRIS SIOUFAS, PRESIDENT
This issue of “Greek American Scientists” informs us of the accomplishments of eight Greek American scientists and the impact they have had on our lives. Since ancient times Greeks have been at the forefront of science. I recently read a book entitled “100 Scientists Who Changed the World” by John Hudson Tiner. Not surprising, the first seven scientists listed in the book are Greek. They include Pythagoras, Hippocrates, Aristotle, Euclid, Archimedes, Eratosthenes and Galen.

Pythagoras (c. 580 – 500 B.C.), who believed that the world was mathematical in nature, applied mathematics to music as well as to astronomy. He is best known for developing the Pythagorean Theorem: the square of the length of the hypotenuse of a right triangle is equal to the sum of the squares of the lengths of its other two sides.

In the time of Hippocrates (c. 460 – 377 B.C.), doctors believed that vengeful gods caused diseases. Hippocrates, the father of medicine, came to the conclusion that each disease had a natural cause. He said, “Find the cause, and then you can cure the disease.” He advised his patients to eat healthy, get plenty of rest and have clean surroundings. Sound familiar? Upon graduation, many of today’s medical students take a modern version of the Hippocratic Oath, which is based on his guidelines for honorable conduct.

A student of Plato, Aristotle (c. 384 – 322 B.C.) founded the Lyceum in Athens. In his work he made careful observations, collected various specimens, and summarized and classified the specimens. This became the basis for the scientific method as we now know it. He wrote treatises on logic, metaphysics, physics, ethics and natural sciences. Although his works were forgotten in Europe during the Dark Ages, when they were reintroduced, they exerted a major influence on Western thought.

"Elements of Geometry" by Euclid (c. 330 – 270 B.C.) was used as a textbook for more than 2,000 years. His book, which summed up the teachings of early mathematicians, included plane geometry, proportion, properties of numbers and solid geometry. He proved that the number of prime numbers is infinite.

Using mathematical concepts to investigate the world, Archimedes (c. 287 – 212 B.C.) developed formulas for finding areas and volumes of spheres and cylinders and built inventions.
Prologue by Mr. Dimitris Sioufas,
President of the Hellenic Parliament,
For The National Herald’s special “Greek American Scientists” insert

The roots of science can be traced to Ancient Greece and ancient Greek philosophy – from Thales of Miletos all the way to Aristotle. Today, the heart of the global scientific community beats in the United States – which has become a second home to many Greeks of the Diaspora.

Today’s Greek American scientists bear the burden of continuing their ancestors’ storied tradition in this field, both now in the present, and in the years to come. The seeds of this tradition were first planted in the United States thanks to Dr. George Papanikolaou, and are blossoming today thanks to prominent scientists who honor their Greek roots and grace the U.S. scientific community.

The Hellenic Parliament is proud of all the scientists in the Greek Diaspora. The National Herald’s special issue dedicated to Greek American scientists illustrates their longstanding presence and contribution. In congratulating them, we hope that the next generation will follow their example all the more, and yield many new successes of their own.

As Greeks, regardless of where we live, we honor our history, traditions, science and our Greek homeland.
Stamatios Krimigis: Argus of the Space Age

By Mark N. Lardas
Special to The National Herald

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rowing up on the island of Chios, Dr. Stamatios Krimigis never dreamed his involvement with rockets would entail more than the Easter rocket war in his home town of Vrodtados. The congregations of two churches in Vrodtados, St. Marcos and the Church of the Panayees, celebrate Easter by shooting homemade rockets at each other. Real rockets.

Young Stamatios made and launched missiles at the rival church. As Krimigis told The National Herald, “I did not know I would someday be part of teams that would send things to the planets.”

Krimigis followed a tradition more ancient than the rocket wars. When Jason set out the greatest voyage of Greek mythology, Jason had the best shipwright of the age, Argus, build the ship. Like Argus, Krimigis designs ships – except Krimigis’ designs travel through interplanetary space.

Jason traveled to the then-distant reaches of the Black Sea. Krimigis’ designs have traveled distances unimaginable to the Argonauts: throughout the solar system and into interstellar space.

Born in 1938, Stamatios grew up in Vrodtados along with his brother, sister and mother. His father immigrated to the United States just before World War II. His father intended to send for the family, but war intervened. The family was not reunited until the early 1950s, when his father could finally return.

Stamatios’ earliest memories are of the German occupation. “We had a curfew. At night, we would put an oil lamp on a low table, with someone on lookout for German patrols. If a patrol came by we would blow out the light until the patrol passed. When we played outside, we would find shards of glass and use them to puncture the tires of German vehicles. At the time, Germans were not nice people.”

Krimigis remembers his youth on Chios fondly. “We did not have electricity until I was in the sixth grade, but it was a happy existence. We had enough food to eat and clothes to wear and good schools.”

Greek society then appreciated the value of education. “There were special ceremonies where kids would get books, prizes, and recognition for academic achievement, not sports.”

Stamatios was a good student. He enjoyed both science and humanities, getting good grades in both subjects while he was in the “gymnasium” (Greek high school). He could have gone into anything, but his mother wanted him to be an engineer. “She had a pragmatic view of education,” recalled Krimigis, “telling me that engineers can always find a job.”

While his father was in America, he set aside money for his son to go to college. Krimigis went to the University of Minnesota living with relatives of his mother, near Minneapolis. He received a baccalaureate in physics from Minnesota in 1961. From there, he went to the University of Iowa, where he received both his masters and doctorate.

At Iowa, Krimigis studied under legendary Dr. James Van Allen, one of America’s true space science pioneers. Van Allen’s experiments, which flew aboard the first American satellite, discovered the radiation belts that now bear his name. Krimigis considers Van Allen his mentor.

After three years on the faculty at Iowa, following the award of his doctorate in 1965, Krimigis moved to the Applied Physics Laboratory at Johns Hopkins University in Baltimore, Maryland. He has been there ever since, eventually rising to the head of the APL’s Space Department in 1991, becoming its emeritus head in 2004.

In 1968, when he arrived at the APL, there were few better places to be. It was the dawn of an age of planetary exploration. Johns Hopkins is close to Goddard Space Flight Center, home of NASA’s unmanned space exploration efforts. Krimigis soon made the APL a major player in planetary exploration, rivaling the Jet Propulsion Laboratory in California.

Krimigis first drafted a proposal for the Pioneer 10 Mission, the first space probe sent to Jupiter. His team was not selected. “I was disappointed,” he said, “but it proved a good thing.”

The loss meant his team was available for the next major project, an ambitious effort to visit multiple planets in one mission, possible because of a rare alignment of planets. In 1970 Krimigis...
Greek American Scientists

Dr. Stamatios Krimigis, at the NEAR Mission Operations Center, announces the safe landing of the spacecraft on asteroid Eros in 2001. To his left sit NASA Administrator Dan Goldin and Maryland Senator Barbara Mikulski, then chair of NASA’s Subcommittee on Appropriations.

It was a big mission. “We had stiff competition,” Krimigis reminisced. “Including a team led by Van Allen.” When the dust settled, Krimigis’ team won. Van Allen was disappointed, but later told Krimigis that if he had to lose, he was happy that he had lost to one of his former students.

It started a career designing interplanetary spacecraft. The two Voyager spacecraft eventually visited all four of the major outer planets. Krimigis was also principal investigator for the Galileo mission to Jupiter, the Cassini/Huygens mission to Saturn and its moon Titan, the Ulysses probe, which explored the Sun’s Polar Regions, the Advanced Composition Explorer mission exploring interplanetary space, and the MESSENGER probe to Mercury.

In the mid-1980s he served as the principal investigator for the Charge Composition Explorer spacecraft, one of three satellites in the Active Magnetospheric Particle Tracer Explorers Program. The mission was a collaborative effort between the United States, Great Britain and Germany. Krimigis worked closely with German scientists and engineers on the project.

Times change. This time, he enticed engineers and technicians on the project. It started a career designing interplanetary spacecraft. The two Voyager spacecraft eventually visited all four of the major outer planets. Krimigis was also principal investigator for the Galileo mission to Jupiter, the Cassini/Huygens mission to Saturn and its moon Titan, the Ulysses probe, which explored the Sun’s Polar Regions, the Advanced Composition Explorer mission exploring interplanetary space, and the MESSENGER probe to Mercury.

He had a problem, though. “In the 1980s we did not have enough missions. Galileo was the only approved mission. I could not keep my people busy. People were saying flying planetary exploration spacecraft were too expensive. I tried to convince NASA and the science community that low-cost missions were possible. At the time low-cost planetary mission was an oxymoron.”

“I convinced NASA to try one,” he said. “The Near-Earth Asteroid Mission was the result. We got it done on schedule and within budget.” Krimigis and his team faced and overcame many challenges with NEAR. It successfully rendezvoused with the asteroid Eros and spent a successful year around Eros.

Krimigis’ team then landed NEAR on Eros. “It was not designed to land,” said Krimigis. “But it would have drifted off from Eros when we ran out of altitude control fuel. So we thought, ‘Why not try it?’ We did it too, eased it down successfully.” NEAR continued sending data back from Eros for two weeks after the landing. NEAR dramatically demonstrated the value of low-cost interplanetary missions. As a result, NASA created the Discovery Program for further low-cost planetary missions.

Krimigis’ achievements have earned him an international reputation. The Academy of Athens elected him to the Chair of Science of Space in 2005. In 2007 he was made chairman of the Academy’s Section of Basic Science. Greece made him a delegate to the EASA Council in December 2006. He received the Smithsonian Trophy for Achievement in 2002. Aviation Week and Space Technology awarded him “Laurels in Space” in 1997 for his work on NEAR, and again in 2001 for resurrecting a mission to Pluto.

With the arrival of the MESSENGER at Mercury, he became the first scientist to have designed and built instruments that have gone to all eight planets. When New Horizons finally reaches Pluto, one of his instruments will be aboard. That makes him the first scientist to send experiments to all nine objects considered planets during the 20th century.

As for the future?

He still conducts research and still publishes science. Krimigis plans to continue his exploration of space for as long as he can. For Stamatios Krimigis, the voyage continues.

The National Herald interviewed Stamatios Krimigis.

TNH: Who were the major influences in your life?

SK: Professor James Van Allen was the major influence in my career. He put me under his wing when I was at Iowa. I owe him a lot for what I have accomplished since then. He gave me my professional direction. Growing up, I would say it was my teachers when I was in Chios. In fact, simply growing up there with its emphasis on education, I was lucky enough to have good teachers who encouraged me to further my education and go to college.

My mother was another big influence. I dreaded coming home with a B+ or A-. I would hear about it from my mother. She felt I could do better. I did not like it then, but now, I realize it was a good thing.

TNH: What led you to physics?

SK: As a freshman at Minnesota, I started in electrical engineering. In my sophomore year, I took physics from an inspiring professor. He made me know that I wanted to go into physics. I changed majors and have been a physicist ever since.

Continued on page 22
The Fundamentals of our Universe: 
Dr. Vaia Papadimitriou Strives to Answer Eternal Questions

By Penelope Petropoul
Special to The National Herald

What is the universe made of? What holds it together? We realize that the world is made of some fundamental building blocks, but what are they? As the website of the European Organization for Nuclear Research notes, the Greek thinker Empedocles first described the elementals as earth, wind, fire and water. Today we know that there are things more fundamental yet – like the atom. For many years, it was thought that the atom was the fundamental building block of the universe. Fundamental in this case means basic – not made of anything smaller. But scientists then realized that atoms were indeed made of something smaller. They are made up of yet simpler building blocks and consist of a nucleus and a cloud of negative electrons.

Scientists then thought that this nucleus must be the most fundamental component of the universe until a later discovery enabled them to realize that the nucleus was comprised of still smaller elements – protons and neutrons. And then ... scientists discovered that even these tiny protons and neutrons are made of even tinier particles called quarks. Physicists now think that quarks and leptons are the most fundamental building blocks of the universe. Of course it is possible that there is a yet even more fundamental particle out there but as of yet, none has been found. Physicists are constantly looking for new particles, and when they find them, they categorize them and study them to understand how they interact.

So why does this all matter? Understanding these particles helps us to understand the origins of the universe and what holds it together. This understanding has vast implications for mankind and can fuel advances in many realms of science from cosmology to medical technology. Of course, this knowledge can also satisfy our most basic human desire to know and understand our world and how it was formed. The thirst for this knowledge is driving truly amazing research at Fermi National Accelerator Laboratory in Batavia, Illinois.

Dr. Vaia Papadimitriou is at the center of this research. She and her colleagues in particle physics study the building blocks (most basic elements) of matter and what holds them together. The field is also called high-energy physics because as Papadimitriou explained, “to study the tiny particles you need high energy – it is somewhat like when you use a microscope; the higher magnifying power you have, the more details you can see. Likewise, the higher energy we have to probe matter, the more details we can see.”

Papadimitriou studies these details working on both the Accelerator side and the Detector side. She serves as assistant division head of Fermilab's CDF detector, the size of a three-story house, weights about 6,000 tons. Its subsystems record the ‘debris’ emerging from high-energy-proton-antiproton collisions, unveiling the secrets of the early universe.
The Fermilab accelerator complex in Batavia, Illinois, accelerates protons and antiprotons close to the speed of light. The Tevatron, four miles in circumference, is the world’s most powerful accelerator.

Many careful preparations by Papadimitriou and her colleagues are required to produce the protons and antiprotons so carefully created. The CDF collaboration, one of which Papadimitriou is a member, consists of approximately 600 people from 53 institutions located around the world.

Fermilab houses the world’s strongest particle accelerator, the Tevatron. As Papadimitriou explained, “We have protons and antiprotons colliding together every 396 nanoseconds and producing high energies (1.96 trillion electron volts at the center of mass), and out of these high energies we have many new particles being produced.” The Fermilab accelerator chain consists of eight accelerators and beam transport lines connecting them. As Papadimitriou noted, it takes the work of seven accelerators before the protons and antiprotons collide inside the largest accelerator, the Tevatron, which measures four miles in circumference. And more than three trillion antiprotons must be collected before they can be sent with the protons into the Tevatron ring. It is a huge, complex, and very complex endeavor.

Much careful preparation by Papadimitriou and her colleagues takes place to ensure that beam circulation and collisions happen smoothly, and if something goes wrong, one must be a detective to determine where in this vast complex and process the problem occurred.

As Fermilab’s website explains, the Tevatron, “accelerates protons and antiprotons close to the speed of light, and then makes them collide head-on inside the CDF and D0 detectors. The detectors are being used to study the products of such collisions.” The CDF collaboration, of which Papadimitriou is a member, consists of approximately 600 people from 53 institutions located around the world.

In addition to producing protons and antiprotons and sending them through the accelerator, Papadimitriou has been participating over the years in all stages of the CDF detector building and its upgrade, in the calibration and maintenance of the detector, in data taking as well as the analysis of the data. She is co-author of approximately 450 publications in peer-reviewed journals, has made numerous presentations at national and international conferences and workshops, and has given many academic seminars and colloquia.

The work Papadimitriou and others like her do in particle physics advances our understanding of what the world is made of, and the technology used to enable this work has benefited society in many ways. As Papadimitriou noted, the World Wide Web was created so that physicists could share vast amounts of data. And, MRI technology and medical accelerators also owe their existence to the accelerators. Papadimitriou also encouraged looking at the Fermilab website and commented on how enthusiasts children of all ages have been while on tours at Fermilab. Children are particularly impressed by the accelerators. Papadimitriou also encourages talking with children about how things work in the world around them—refrigerators, microwaves, baseball, sailing. When one talks about the scientific principles behind household items and familiar activities...
Professor Christos Papadimitriou: Embracing the Past, Navigating the Future

By Nile Southern
Special to The National Herald

Dr. Christos Papadimitriou is a modern-day Greek philosopher, scholar, novelist, essayist and theoretician. Papadimitriou, professor in the Computer Science Division at the University of California, has written a dizzying array of papers on subjects dealing with "multi-objective optimization," "biology database theory, complexity and the Internet." His inquiring mind delves into the history and future of man's ability to quantify knowledge and use it most effectively. As a writer of an innovative novel dealing with the history of computing, and a forthcoming graphic novel, he says, "Mathematics and literature have been subjects that have been divorced for too long, but there is a movement to bring them back together again. I think my novels should be seen in this spirit."

For a man on the future's cutting-edge, Papadimitriou is inspired by the past. His novel, "Turbing," and his forthcoming graphic novel entitled "Logicianix," written with playwright/mathematician Apostolos Doshiadis, play out as an extended homage to the thought processes, crises and dramas that went into the birth of his profession. His book, "Computational Complexity," is one of the most widely used textbooks in the field of computational complexity theory, and his book "Algorithms," (co-authored with Sanjoy Dasgupta and Umesh Vazirani,) according to the publisher, McGraw Hill, "explains the fundamentals of algorithms in a story line that makes the material enjoyable and easy to digest." Despite his rigorous academic life in the U.S., Papadimitriou keeps very close ties with Greece, where he lives for several months each year.

Christos Papadimitriou spent his early childhood years in Lidoriki, a town near Delphi on Mount Parnassus. "My parents were born in Arcadia, in the Peloponnese, in two ancient towns: my mother in Tegea, my father close to Asea. My father was a high school math teacher who was involved in the resistance against the Germans — the liaison between the two major, and later warring, resistance movements, EDES (Ethnikos Dimokratikos Ellinikos Syndemos) and ELAS (Greek People’s Liberation Army). As the long war was winding to an end, in his late forties he met my Mom, who, like him had given up hope for family. I was born on August 16, 1949, the day that is considered the beginning of the new era — the day after the final defeat of the (Communist) insurgents."

When I was born, my father was teaching at Lidoriki. My childhood was all rural mountainous Greece, complete with a genuine Roumelliot accent that would give me much grief for years after I came to Athens at the age of six. I went to an unremarkable elementary school and the elite Varvakio high school. When I finished high school in 1967, almost the day I finished, the coup that brought in the dictatorship happened."

TNH: What was the dictatorship like for you?
CP: These were dark years for Greece. It was an operetta — like the Charlie Chaplin film "The Dictator." Largely incompetent and marginally sane people suddenly running a country — so it would be funny if it wasn’t so tragic — if it hadn’t truncated so many lives.

TNH: How did it affect your studies?
CP: My student years were no fun. There was a resistance from the beginning — it grew, and then exploded. Today, I sit in front of my computer, I can click — and see the whole world — as everyone in Greece now does. But back then, I was convinced that my destiny was to stay in my town and my neighborhood — to be an engineer, and live my life there. At Athens Polytechnic I studied mechanical and electrical engineering — I didn’t have an inclination for either subject — it was the most challenging and prestigious school to get into. I like mathematics.

TNH: How did you come to the United States?
CP: I was foolish and selfish. The way I was thinking back then, I thought the Greeks will never rise up against the junta — it will be like Franco’s Spain for another 40 years. I came to the United States expressly to flee that terrible situation. After I left the Army, I left Greece immediately. Of course, the irony is that two months after I left, as soon as I arrived at Princeton, the student insurrection in Athens Polytechnic, my school, erupted. Some of my friends were killed. Tragic event. But of course it was the beginning of the end for the Junta. By this time I was hooked in computer science.

TNH: At Princeton, what did you study?
CP: Life is funny. Because of my narrow horizons, I thought it wasn’t possible to move away from my subject. So, I applied to Princeton’s electrical engineering department. But my application had complicated enough sentence structure for them to place it in the computer sciences pile. While I was seeing this as a way out of Greece, and a way to continue with my life, I encountered this incredible field — that became the passion of my life. I remember feeling supernaturally, spiritually grateful and elated. The depth and elegance of this field captivated me immediately. It was a very dramatic moment for the development of computer science. More powerful computers were becoming along. However, it was becoming clear that there were problems that computers could not solve fast enough.

TNH: This opens up a theme that recurs in your work — the fascinating time which you've researched about the dawn of modern-day computer sciences — can you talk about that?
CP: For the past 40 years, one of the most challenging intellectual problems that comes out of computing is this: no matter how pow-
erful our computers become, there are certain tasks that are still beyond them. These are archetypal hard problems. The technical term is “NP-complete.” (Problems that can be solved by computer, but within unknown timeframes). In the ’50s and ’60s, computer scientists struggled to solve the world’s problems. They came up against certain quandaries — such as the traveling salesman problem. In this problem, you have a bunch of cities, and you need to find the distances between them. You want to organize a tour of all the cities that minimizes the amount of travel between. The problem is, after all the decades of working on this problem, we don’t know a better way to solve it — other than enumerating all the possibilities.

TNH: How has the Internet affected computer sciences?

CP: The Internet is surely one of the most valuable resources — and an indispensable public good. It has quenched and intensified the thirst for information, for education, communication, publicity, social contact. Until the late ’90s I was obsessed by the phenomenon of the computer. Then I realized there was something more complex and more perhaps more crucial for humanity. In many ways computer science is now like a natural science, or a social science. Why? Because nobody really designed the Internet — it sort of appeared one morning. And so, we must approach it the way neuroscientists approach the brain, or economists approach the market — with the same awe, bewilderment and humility.

TNH: Not to blow your own horn, but do you think Greeks are perhaps naturally suited to this kind of large-scale, grand thinking?

CP: Excellent point. Who knows? Of course I’ve contemplated thoughts like that. There are an amazingly large number of excellent computer scientists of Greek origin working in the United States. Completely disproportionate. Frankly, in my opinion, it has a lot to do with the fact that there is a lot of talent in Greece, and the Greek universities, until recently, left a lot to be desired, especially in terms of continuing study. And so a lot of Greeks flooded the United States for graduate studies and have excelled academically.

TNH: What are your feelings about your new project with playwright Apostolos Doxiadis: “Logicomix.”

CP: I firmly believe that the Internet and all that came with it is humanity’s greatest hope. There are many people who cannot see beyond the detail of pornography. The Internet is so important it is really missing the point to focus on the negative. After 9/11, how many times have we read that Al Qaeda uses the Internet? Or the way the media report, say, a murder-suicide of young lovers — who met on the Internet. If they had met at a bus stop, would it be mentioned? When you see it, it reads like a condemnation — an indictment. Perhaps the biggest thing that’s happening right now is social networks — which we started hearing about two years ago. So, what will happen in 2020? There are people who tell you they know, but they’re lying.

TNH: What do you say to people who are afraid the Internet may bring harm to their children?

CP: I understand the dangers, of course. I do have a pre-teen-age daughter, but I would be scared if she didn’t get involved in the Internet. It would mean that she would be locked out of what is interesting and has a tomorrow. Can there be too much gaming, too much texting and you-tubing? Of course there can. But I believe these children will be different from us. I’m not sure in which direction, but it’s a new world. It makes no sense to try to stop it.

TNH: Alan Turing was one of the seminal founders of computer science and artificial intelligence before the War and after. He brought together in his work symbolic logic, electrical engineering, numerical analysis and a mechanical vision of human thought processes. What inspired you to write your book “Turing (a Novel About Computation)?

CP: You must be familiar with the great Greek poet Kavafis. I was in Greece, and I had seen a film entitled “Kavafis” — about his life — a very idiosyncratic biography. As I was coming out of the theatre, this idea came to me, I’ll write a book called “Turing!” I was fascinated by the idea of paying homage to an intellectual hero by a work of art that bears his name. So, that night the book was born. It is a tribute to Turing, in the form of a modern love story that has the Internet as its locale.

TNH: Tell us about your new project with playwright Apostolos Doxiadis: “Logicomix.”

TNH: “Logicomix,” a graphic novel dealing with philosophers Bertrand Russell and Kurt Gödel, written by Apostolos Doxiadis and Christos Papadimitriou. The book, forthcoming from Bloomsbury USA, also portrays the co-authors (featured above) as they collaborate to tell the sprawling story. Artwork by Alecos Papadatos and Annie Di Donna. Reproduced by permission of the authors, illustrators, and Bloomsbury USA.

This panel is from “Logicomix,” a graphic novel dealing with philosophers Bertrand Russell and Kurt Gödel, written by Apostolos Doxiadis and Christos Papadimitriou. The book, forthcoming from Bloomsbury USA, also portrays the co-authors (featured above) as they collaborate to tell the sprawling story. Artwork by Alecos Papadatos and Annie Di Donna. Reproduced by permission of the authors, illustrators, and Bloomsbury USA.

Apostolos Doxiadis, pictured above, and Christos Papadimitriou wrote the graphic novel, “Logicomix.” Papadimitriou says of the book: “It is really the story of two friends, Apostolos and myself, as they try to understand how mathematics is done, to systematize it, and ultimately try to mechanize it. Some of the world’s greatest mathematicians were consumed by this vision. Bertrand Russell advanced it as much as he could until he became completely disillusioned and bitter with it, and ultimately Kurt Gödel in early 1930s — perhaps the greatest scientist of the previous century — proved the devastating ‘Incompleteness Theorem’ that says there can be no foolproof mathematical system that proves all theorems. This was an incredible point for science, because suddenly scientific and mathematical problems can be solved, that there are limits to our abilities to understand and harness the world, and, in fact, these limitations are in a fundamental way computational — especially apparent after Turing’s
Professor James Kakalios: Superman in Disguise

By Elaine Thomopoulos
Special to The National Herald

James Kakalios, the mild-mannered, soft-spoken, bespectacled professor (Superman in disguise?) packs a big punch in his physics courses. By using examples gleaned from his encyclopedic knowledge of superheroes, dating from the 1930s, he grabs the attention of his students, while they in turn learn about physics. The exciting freshman seminar he created at the University of Minnesota, “Everything I Know about Physics I Learned by Reading Comic Books,” helped him earn a teaching award in 2003: the Institute of Technology Student Board – School of Physics and Astronomy Professor of the Year, and the Charles E. Bowers Faculty Teaching Award. It also led to his being featured in magazines such as People, and his popular book, “The Physics of Superheroes.”

POPULAR PROFESSOR
This is how his students describe him:

“A really funny guy, you don’t know how helpful humor can be in understanding any subject until you have a prof like Kakalios. His lecture might be the only one you make a point NOT to skip, just because he makes the topics that interesting.”

“Kakalios is the man! He may have his quirks, but a very smart guy.”

“Hilarious. Loves Spiderman, or comic books in general. He does lots of cool experiments throughout the semester.”

“Professor Kakalios is a Riot, dude knows his stuff, and makes it entertaining. You will love his constant reference to comic book characters; you know he has read them all. This guy is awesome and a great teacher. You will enjoy his class.” (ratemyprofessors.com)

COMIC BOOK FAN
When I asked him about the role of comic books in his life, he reminisced, “I remember sitting out on the brick stoop reading comics, not even being able to read. I picked up vocabulary. You could follow what was happening.”

“There was a philosophy that came through. They teach ethics, right or wrong. If you have a super power, what do you do with it? ... We all have talent. What do you do with it? How do you decide what you do with it? Besides, there were very cool explosions.”

Comic books helped shaped his interest in science. “There is an indoctrination in the sciences. The spirit. There is a high emphasis in knowing the rules of the game, creative problem solving, out-thinking the bad guys.”

He added, “When I go to comic book conventions, it is striking how many people work in high tech, science, information technology. A lot of scientists got their start reading comics. But so few wear capes.”

ESTEEMED EXPERIMENTAL PHYSICIST
Kakalios has made the most of his talents, as a teacher, author, as well as an experimental physicist. He became a professor at the University of Minnesota, after receiving his bachelor’s degree at City College of New York and then his Ph.D. at the University of Chicago. Kakalios said, “Upon joining the School of Physics and Astronomy at the University of Minnesota in 1988, I have built up a research program in experimental condensed matter physics, with particular emphasis on complex and disordered systems. My current research ranges from the Nano to the Neuro.”

With the goal of developing new material that would lead to cheaper and better solar cells, he has been studying the optical and electronic properties of hydrogenated amorphous silicon thin films containing silicon nanocrystalline inclusions. The research elucidates the properties of these mixed phase materials in order to optimize their characteristics for solar cell applications. He says, “I have helped advance the understanding of the electronic properties of amorphous silicon conductors used to make the solar cells. These (conductors) are currently in use in solar cells, flat panel displays, copiers and in many other applications.”

In collaboration with a professor of neuroscience at the university, A. David Redish, he is conducting investigations of voltage fluctuations recorded from the brains of awake, behaving rats. This has led to the identification of a coherent oscillation in the stratum which may have implication for our understanding of Parkinson’s Disease. I asked him to explain the experiment, “You stick an electrode in, and you record the voltages that are coming from all the neurons that are firing. What you will see is total chaos in the voltages and suddenly you will record a very coherent oscillation or sign wave that comes through and will suddenly disappear. Nobody understands what this is yet. Some people think not so much. It is like the Wild West. Lot of fun from a scientific point of view. It’s at the forefront of science. At this stage, there is so much that is not understood so it makes it a very exciting time for scientists.”

FAMILY MAN
Family plays an important role in Kakalios’ life. His paternal grandfather, George, and grandmother, Eva Giannoulis, immigrated to America from Greece. His yiayia came from a family of about 12 children and emigrated from Calamata about 80 years ago when she was 16 years old. Kakalios reported that she did not know anybody when she came to America and worked as a seamstress. His grandfather worked as a restaurant chef. They raised their two boys in the Ditmars neighborhood, which was like “little Greece.”

His father, Nicholas, past president of the Greek cabdrivers association, and mother, Augusta, a second generation Latvian, brought up their two boys in the Woodside neighborhood of New York, where the TV series “All in the Family” was supposed to have taken place.

When I asked him to tell me about those in his family who influenced him, he responded: “My parents. My father. Got my work ethic from him. My mother – I got the Latvian strong work ethic from her. Books and literature were important to her. We were always going to public library. She was a reader. Books were always around the house. Also important was my father’s brother, (Stanley), principal and district superintendent in the New York City schools. Education was highly regarded in my family.”

He and his wife Therese have also stressed the importance of education in their own family. Thomas just started University of Chicago, his parents’ alma mater. His daughter Laura is a senior in high school, and David is in the ninth grade. Regarding his children, he quips, “That’s why I am an expert on noise and disordered systems.”

In my contact with him, Kakalios interspersed the serious with the humorous. In an email he related: “I’m off with my family to drive my oldest son off to college. (I can’t be that old! There must be some slip in the space-time continuum!).”

He got serious when I asked him, “What are your accomplishments?” He didn’t respond with a list of his myriad accomplishments but with his goals, “I try to be a good husband and father, good teacher and scientist.”

AUTHOR OF “PHYSICS OF SUPERHEROES”
Kakalios is best known to the general public for “The Physics of Superheroes.” In this book, which I reviewed for the Greek Circle Magazine, he demonstrates his “Superman” power as a gifted author. He knocked out the “afraid of science
and math” trait in me and with humor and wit taught me how everyday things like the human body, automobile airbags, transistors, television, microwave ovens and dimpled golf balls work.

Within this easy-to-read volume he covers Newton’s laws of motion, conservation of energy, thermodynamics, electricity and magnetism, quantum mechanics, solid-state physics, and much more.

He introduces “other-world” phenomenon as the Big-Bang theory, time travel, and parallel universes. Of the latter he notes, “The many worlds model has been locked in the metaphoric attic until very recently.” He was never taught this model in school but discovered it by accident when as a graduate student he came across a copy of “The Many-Worlds Interpretations of Quantum Mechanics.” He informs us that today’s string theorists support this model.

Kakalios ventures into answering questions that illustrate Newton’s Laws of Motion. One such question: How was Superman able to “leap tall building in a single bound”? The answer: He was born on Krypton, which theoretically had a gravitational pull 15 times more than of Earth. His stronger bones and muscles enabled him to accomplish this feat.

He also answers the query about what made Krypton explode: a super-dense and unstable material like a neutron star at its core. He speaks of the creators of Superman, Jerry Siegel and Joe Shuster, with admiration, “These teenagers from Cleveland, Ohio, either had an understanding of astrophysics and quantum mechanics that exceeded that of many contemporary physics professors in 1938, or they were very lucky guessers.”

In the section called “The Day Gwen Stacy Died: Impulse and Momentum,” he explores whether or not the web Spiderman used to try to save his girlfriend when she was hurled from the Washington Bridge by the Green Goblin actually killed her instead. Answer: it did.

Whether or not you are a comic book fan or not, the comic hero/heroine examples give you a chuckle and teach a lesson. Take the example of Ant-Man, who is as tiny as an ant, yet maintains the strength of a normal size human. How does he escape from the vacuum bag the villain has sucked him into? On the way to the answer an explanation is given about levers, torque and rotation and the wonder of the human body. Kakalios notes, “Our strength comes from our muscles and skeletal structure that make up a series of interconnecting levers.” After explaining.
Traianos Gagos: Breathing New Life into Charred Ruins

By Artemis Leontis
Special to The National Herald

Ruins from burned buildings of entirely different eras have touched the life of Dr. Traianos Gagos, professor of Greek and papyrology at the University of Michigan, in important ways.

In the early 1940s during World War II, the Nazi occupying forces burned his paternal home in Karpì, a village of Kilkis northwest of Thessaloniki. The destruction came in retaliation for his grandfather’s participation in the Resistance movement. Having lost his home, Gagos’ father lived at the mercy of whatever it could cultivate on eight “stremmata” (about 8000 square meters). Little Traianos started working in the tobacco fields when he was five. He remembers his mother and aunt taking the place of a dead horse behind the plow. He learned early on how hard, insecure and unfair life can be, and determined to carve a different path for himself.

Around the turn of the seventh century A.D., more than 1300 years before the Gagos family’s very consequential loss, a room adjacent to the Byzantine Church of Petra, Jordan burned down. It was part of the church’s storage facilities where the archdeacon kept his personal papers and some church documents. The charred effects of that room were about 130 flattened, carbonized scrolls. These hand-inscribed “papyri,” produced from the fibrous papyrus plant of the Nile Delta (the English “paper” derives from the Greek “papyros”), remained buried underground until their chance discovery in December 1993. In this case, Petra’s loss was Gagos’ gain. He has built his reputation on deciphering the carbonized Petra Papyri.

Gagos is a trained papyrologist. This means that he works to conserve, decipher, and interpret “papyri,” ancient literature preserved on papyrus manuscripts from the Greco-Roman world. He holds the positions of professor of Greek and papyrology in the University of Michigan Department of Classical Studies, archivist of papyrology in the Graduate Library, and director of the Advanced Papyrological Information System a worldwide collections-based repository hosting images and information about papyrological materials.

Gagos reached the top of his field through years of hard work — and sacrifice by his parents. When his mother’s emigration request was denied, the family became internal migrants, moving to Thessaloniki in 1970 and laboring so that Traianos and his sister, Eleni, could continue their studies beyond elementary school. His parents sent Traianos to Germany in 1976 to visit cousins and learn some German. In 1978 Traianos gained entry to the University of Ioannina and studied philology, the science of language and literature with a special focus on classical Greek and Latin texts. He was exposed to papyrology in his fourth year, and found he could easily read its broken bits of difficult, ancient handwriting.

In fact, he liked deciphering papyri’s coded language. It was like bringing the dead back to life. In Gagos’ eyes, papyrology is a bridge not only between disciplines — it combines archaeology’s work of excavation and conservation with philology’s reading and interpreting texts. “It’s a bridge between past and present,” he says. The papyrologist’s decipherings bring readers face to face with the contingencies of human activities. This is true especially in documentary papyri. For example, P. Mich. inv. 6922, a Greek text from around 537 A.D. that professor Gagos edited, is a deed settling a dispute over a piece of land. Poor Aurelios Nikantinoos inherited from his parents not the land he was expecting but their liability when they used the land to secure a loan. The property went to Nikantinoos’ nephew and nieces, who sold it to Aurelios Phoibammon and his wife Aurelia Anastasia. So Nikantinoos found himself paying for land he did not own and a debt that was not his, while Phoibammon and Anastasia were enjoying both the property and Nikantinoos’ mortgage pay-

Here is a detail from the Petra Papyri, volume 1, text #5, a request for transfer of taxation responsibility, dating from 538 CE. It is a multi-spectral digitized image produced by Steven W. Booras and Gene A. Ware, Institute for the Study and Preservations of Ancient Religious Texts, Brigham Young University.

Dr. Traianos Gagos holds a burnt Petra papyrus, set between glass. The photograph was taken at the American Center for Oriental Research, where he conducts his research. More than 1300 years ago, a storage facility adjacent to the Byzantine Church of Petra, Jordan burned down. The charred effects of that room were about 130 flattened, carbonized scrolls. These hand-inscribed papyri, produced from the fibrous papyrus plant of the Nile Delta, remained buried underground until their chance discovery in December 1993. Gagos has built his reputation on deciphering the carbonized Petra papyri.
Dr. Traianos Gagos is at Petra, Jordan, where the Petra papyri were discovered in 1993. He travels to Jordan each summer to research the Petra papyri, which are more than 1300 years old. Gagos, a trained papyrologist, works to conserve, decipher, and interpret papyri, ancient manuscripts from the Greco-Roman world.

Throughout the academic year Gagos balances a dizzying number of time-consuming activities: teaching, advising, supervising undergraduate honors theses and Ph.D. dissertations, overseeing and researching U-M’s very significant Papyrus Collection, training staff, writing grants and reaching out to the broader community by giving lectures, interviews, and tours.

A big part of his work involves overseeing the Michigan portion of the Advanced Papyrological Information System. APIS expands the Duke databank to produce a virtual library of digital images and catalogue records from many university collections. Between 1991 and 1995 Professor Gagos led this expansion by digitizing the Michigan Papyrus collection and putting it on the World Wide Web. His hope that other universities would join U-M eventually materialized. Gagos holds a very deep political belief in democracy, and he applies this to his academic work. For the past 20 years, he has been working tirelessly to make papyri fragments widely accessible. He wishes to put the sources of knowledge into everyone’s hands. In fact, today anyone can search the APIS website to get a close view of these once buried treasures. And he has taken the work of bringing papyri to mass audiences even further.

“My real efforts at popularizing papyrology are to be found in our own U-M webpages, where I have overseen the production of several modular exhibits for general audiences and K-12 education” (www.lib.umich.edu/pap).

He devotes his summers to research on the Petra papyri in Amman, Jordan. Gagos first went to Petra in 1995 on a National Endowment for Humanities grant with Professor Koenen so that they could begin conserving and deciphering the Petra Papyri. He took to Petra like a fish to water or, more aptly, since Gagos is ethnically Vlach, like a nomad to a caravan-route city. Inhabited since prehistoric times, Petra (from the Greek word “petra,” rock) is a crossroads. It lies in a basin among the mountains east of the large valley that runs from the Dead Sea to the Gulf of Aqaba and connects Egypt, Syria, and Arabia. The Nabateans, a nomadic tribe, made it their capital in the second century B.C., and the city flourished as an economic and religious centre in the Roman and early Byzantine periods for several centuries, primarily because of its place in the long distance trade in spices and aromatics. Half-built, half-carved into sandstone cliffs, it blended Eastern traditions and Hellenistic architecture. By the late sixth and early seventh century, however, the years when the Byzantine Church collapsed and burned, Petra was in decline after several shattering earthquakes and changes in over-land trade routes.

Yet Petra's carbonized papyri found in the annex of the burned Byzantine Church, which Gagos has been studying now for 13 years, belies the sense of isolation. “Here are texts dated to the period of 537-94, when Petra was part of the Byzantine Empire. They show the people of Petra making contacts outside their narrow province. They were attending to the Imperial oaths of Justinian; they were looking to Constantinople and had distinguished scholars residing in Giza. And their language is an interesting mixture. There are texts in Greek with Latin terms; buildings and land plots listed in Greek but combining Aramaic and Arabic. Place names are of Semitic origins, but personal names are Romanized. The province is trying to make itself relevant to the Empire.”

The Petra Papyri present interpretive as well as technical problems. The technical challenge derives from the papyri’s burned, compressed state. How does one take apart charred remains without destroying every trace? Carbonized papyri (the most famous are the Herculaneum papyri, discovered in a Roman villa buried by ash during the eruption of Mt. Vesuvius in 79A.D.) have a charcoal-like, blackened appearance. They are usually heavily damaged. However, the process of carbonization also protects them from future decay. With the help of modern multispectral imaging techniques, papyrologists are learning to read the contents without taking the scrolls apart. The interpretive challenges are certainly equal to the technical ones. The Petra Papyri are the only written pages in an otherwise blank history book for the city and the region. How does one make sense of them?

Gagos has learned from life to turn a handicap into an advantage. What Petra offers is a great archaeological context. Most ancient papyri have lost the context of their production and transmission by the time they reach scholars’ hands, but the Petra Papyri were found “in situ.”

In the texts, which preserve titles and inscriptions from 500 years ago, Gagos hears the voices of people telling him they are not provincial; they are from a different place. He hears the anxiety of people in the margins who are saying, “What’s going on out there? Do we matter? Are we a part of this?” Gagos works closely with archaeologists as he tries to grasp the perspective on life in the provinces in late antiquity. He is currently working toward a publication of the papyri that will make both the texts and their context available for future scholars.

Where does he go when he wants to get away? His vacation days are just a handful, but Gagos knows the destination. In 1967 his parents began building on the site of the desert home in Petra. They completed the house in the 1980s, and, since their retirement, spend summers there, winters in Thessaloniki. Gagos manages to visit Greece each summer. When he does, he kicks back his heels for a few days in the family home, built on the charred ruins of the house the Nazis burned.

Dr. Artemis Leontis is associate professor of Modern Greek at the University of Michigan. Her books include “Topographies of Hellenism: Mapping the Home-land” (Cornell 1994), “Greece: A Traveler’s Literary Companion” (Whereabouts 1999), “What these Ithakas Mean: Readings in Cavafy” (ELIA 2002), and “Culture and Customs of Greece” (Greenwood, forthcoming). For the past three years, she has been creating an archive of interviews with Greek American intellectuals, artists and scientists.
Leda Cosmides: A Revolutionary Evolutionist

By John P. Psiharis
Special to The National Herald

Leda Cosmides, often in concert with her partner and husband, anthropologist Dr. John Tooby, revolutionized the field of psychology through groundbreaking research into the emerging field of evolutionary psychology. Her work has been internationally recognized and her honors have been many.

She has traveled the globe to spread the word about evolutionary psychology, a field that she pioneered and helped to bring to the forefront of modern psychology. Japan was just her latest destination. While there this past summer, Cosmides participated in several human behavior and evolution meetings. She met with Japanese colleagues who shared her passion for evolutionary psychology. Cosmides has given lectures throughout the United States, as well as London, Edinburgh, Rio de Janeiro, Berlin, Munich, Aarhus, Mexico City, Vancouver, Montreal and Sao Paulo.

She has traveled to Greece, the ancestral home of her mother’s family. They come from a village near Tripoli in the Peloponnesus region of Greece. Her maternal grandfather came to the United States at age 12. He worked on the railroads and started a neighborhood grocery store. The store, located on Chicago’s north side, was a precursor to today’s supermarket, featuring products of multiple vendors, a concept that was not common in that era. As a shopkeeper, he was a target of theft and attempted mafia shakedowns, which he resisted. Eventually he went back to his village in Greece to find a wife.

Her father’s family came from Turkey. Her paternal grandfather came from Corlu and her paternal grandmother from Constantinople. Her paternal grandfather fled Turkey to avoid persecution. He settled in West Virginia and later Pittsburgh. He corresponded by mail with his soon-to-be wife and did not meet her until the day of their marriage.

Born in Philadelphia in 1957, Cosmides moved to a town near Bethesda, Maryland at the age of two. Her father, an accomplished pharmacologist, had accepted a position at the National Institute of Health, eventually becoming associate director of the National Library of Medicine. Prior to his government service, he helped invent stilazine, while working for Smith, Kline and French. The pill is still used today to treat schizophrenia. As an inventor of the pill, he was invited to suggest a name for the new drug. He named it in honor of his favorite cousin, Stella. At that time, Cosmides recalls, the Freudians considered psychopharmacology an anathema for mental illness. “It’s remarkable that it is still in use. It is still an effective drug,” says Cosmides.

Her interest in psychology came early in high school, where she was a good student who excelled at math and science. But she was worried about the state of the world: “If you are a child in the late sixties, you grow up with war, assassinations, demonstrations and intergenerational conflict. From our backyard, you could see the smoke from Washington burning when Martin Luther King was killed. Every demonstration, for every cause, was local news because we lived in a suburb of Washington D.C. The world seemed like a mess, and I thought there must be better ways for people to live.” But she also thought that ideology alone could not tell you what these better ways might be. Cosmides continued, “It felt like every institution and tradition was being uprooted and discarded, sometimes for good reasons, but usually without any evidence that the alternatives being proposed would produce the utopia that people envisioned. I soon realized that, if you want to improve society, you first need to understand human nature. Otherwise, you are likely to make things worse rather than better.”

The creative individualism of students at Harvard University attracted Cosmides to enroll in their undergraduate program. “When I visited Harvard, I met people who were doing interesting and exciting things on their own initiative — very different from other schools, where most students just did what they were told.” The field of evolutionary psychology did not exist at that time. But after my freshman year, I discovered that Harvard was a hotbed of research into evolution and behavior.

As a sophomore, Cosmides met Robert L. Trivers, an associate professor at Harvard and a major figure in the field of evolutionary biology. “I learned a lot of my evolutionary biology from him,” says Cosmides. She joined a group of like-minded scholars who met regularly at the home of Irven DeVore, a professor of anthropology at Harvard. “There was an intellectual revolution going on, and Irven DeVore’s living room was its headquarters,” she said. So Cosmides stayed at Harvard for graduate school in cognitive psychology. Although Harvard’s psychology faculty at that time were mostly hostile to evolutionary approaches to their field, Cosmides found support and camaraderie from the primatologists, anthropologists, and evolutionary biologists in DeVore’s “Simian Seminar.”

It was at this time that Cosmides met John Tooby a graduate student in biological anthropology at Harvard. The two would not only form a personal bond through marriage but would also go on to collaborate professionally. “We do everything together. All of our work is collaborative,” explains Cosmides. “There is no competition. What is good for John is good for me. We think very similarly which is helpful.”

“At that time, most psychologists thought that the human mind is a blank slate,” Cosmides remembers. Psychology was dominated by the philosophy of B. F. Skinner, a leading psychologist of his time and a professor of psychology at
Harvard University. Skinner was a “radical behaviorist” who thought the brain had two, and only two, laws of learning, based on reward and punishment. “By rewarding or punishing people in just the right way, he thought you could elicit any behavior you wanted — he thought you could make a woman want to nurse another woman’s child as much as her own, or make a man delighted to find his wife having sex with another man,” Cosmides explains.

Evolutionary psychology is based on the notion that evolution applies as much to the brain as it does to other organs in the body. Cosmides explains, “When you look at other organs of the body, you find specializations: the heart is well-designed for pumping blood, the liver for detoxifying poisons — each was engineered by natural selection to solve a particular problem very well.” To survive and reproduce, “our hunter-gatherer ancestors had to solve many different kinds of problems, each of which required programs that process information in a precise way.” For instance, our minds evolved some programs specialized for acquiring language, others for avoiding incest, for avoiding predators, for cooperating with others, and so on.

Cosmides explains, “Taking seriously the idea that the brain contains a collection of programs, each of which was designed by natural selection to solve a different adaptive problem, changes your scientific intuitions. Our ancestors were hunters and gatherers who had to be able to find food, hunt, attract fertile mates, raise children, cooperate with others in their social group, help their close relatives, and resist aggression. They had to learn what could eat them and what they could eat.” Cosmides compares the mind to a personal computer. “Computers have different programs; each specialized for solving a different problem. For example, Excel is well-designed for doing spreadsheets and Word for writing, but the very properties that make them good at their tasks make them bad at others — you would not want to write articles in Excel or do spreadsheets in Word.”

While defining the topic of her thesis at Harvard, Cosmides encountered challenges. “Nobody in my department was evolutionary. Nobody knew what it would look like to take an evolutionary approach to cognition. I had to explain what the evolutionary approach was and why it was important.” Some twenty years later, the list of honors and awards that Cosmides has achieved illustrates the success she has had in advocating this new approach.

Her honors include: Recipient of the National Institutes of Health Director’s Pioneer Award; a Guggenheim Fellowship, the American Association for the Advancement of Science Prize for Behavioral Science Research, and the American Psychological Association’s Distinguished Scientific Award. She has authored or edited, often in collaboration with Tooby, five books and over eighty articles in various scientific journals. She has organized or spoken at numerous conferences, seminars and symposiums. Armed with a doctorate degree in cognitive psychology, Cosmides interviewed at universities throughout the country. “There were many Ph.D.s and few jobs,” recalls Cosmides. “I was very controversial for a period of five or six years. I was interviewed for many jobs, but academic selection is based on group consensus, and my taking an evolutionary approach would always enrage at least one or two people.” She continued: “My not being hired right away turned out to be good for the field. In academic departments, the one talk everyone shows up for is a job talk. So the fact that I was giving job talks all over the country meant many more people were hearing about evolutionary psychology than would have if I had been hired right away!”

One university was not afraid of evolutionary psychology, the University of California at Santa Barbara. Tooby was invited to join the faculty there in 1990, and Cosmides in 1991. “There were not a lot of academic jobs available. We were just looking to be employed in the same city. This was heaven. We were very happy to come here and delighted that we ended up at the same university. We lucked out.” In 2000, she was elevated to full professor status within the Department of Psychology.

Inspired by this newfound academic support, Cosmides and Tooby would go on to co-found and co-direct the Center for Evolutionary Psychology at UCSB. Created in 1994, the Center is, as Cosmides describes it “a clearinghouse for research and training in evolutionary psychology.” “Human nature is central to everything, so scholars from many fields come to the Center. It is great for our students,” Cosmides added.

“People, who are interested in evolutionary psychology can be in different academic departments such as psychology, biology, education, anthropology or medicine. We meet weekly to design research with our graduate students and with visitors from other universities who come here on sabbatical. Grad students and professors have come from Denmark, Belgium, England, France and throughout the US,” Cosmides explained.

A focus of the Center has been its site in the Ecuadorian Amazon. The site has provided the ideal setting for cross-cultural experiments. Cosmides explains, “It is different in as many ways as possible from life in the U.S. The people there live among kin in tiny villages; they get all of their food by foraging and gardening; they believe in witchcraft; and have little outside contact. It is similar in some ways to the conditions in which humans evolved. If you think a program is universal in our species, this is a good place to test for its presence.”

Although Cosmides does not speak Greek, she speaks fondly of her Hellenic heritage. She attributes much of Greek American success to education. Cosmides stated “Economic success depends on education. And among Greeks at all levels of society, education is valued.”

Cosmides views the future of the “omogenia” as a challenging time. She remembers: “At my parents’ church in Bethesda, everyone had a Greek name. Now, at the Greek church in Santa Barbara, a majority have Greek names.” She continues: “It’s going to be hard for the Greek community to maintain an identity. I’m not saying it shouldn’t. But it is going to be difficult as the community becomes less and less ethnically Greek.”

Continued on page 23
Menas Kafatos: Solving the Labyrinth

By Mark Lardas
Special to The National Herald

Dr.

Menas Kafatos is a man who looks for connections. For him, the world consists of a series of puzzles to be solved. He has worked to solve the mysteries associated with the physics of black holes, structure of information, philosophy of physics and mysteries of the global environment.

It is the interconnections between things that most fascinates him. It is almost as if he is finding the path through a maze -- a scientific version of the Labyrinth. It may be due to his heritage.

Kafatos, born in 1945, grew up in post-war Crete. The Kafatos family has been in Crete a long time, although perhaps not since the time of Minos. Menas Kafatos is proud of his heritage. “It is not a common name, but we are one of the oldest families in Crete,” he states.

His family has an uncommon ability for producing scientists. His oldest brother, Fotis, is now an internationally renowned biologist, and a cousin, Anthony Kafatos is internationally renowned biologist, advising farmers on crop cultivation and agricultural science. Kostas’ territory covered the entire island, however, and before he retired he had become the agricultural inspector general for Crete.

What impressed Kafatos the most about his father? “His honesty. Back then, government workers had a reputation for corruption. Not my father. He never took bribes. Money was tight when I grew up, but he taught me the value of hard work and honesty.”

Another major influence was Uncle George Xiroadakis, a mathematician. “My uncle instilled in me a fascination with mathematics and the sciences.”

He also credits his brothers and mother with shaping him. “My two older brothers, Anthony and Fotis, always protected me and guided me. And last but not least, my mother Eleni, who showed me the value of good family, the greatness of tradition and values, and the importance of loving people around us.”

In his early days, Kafatos made a decision that changed his life. “I was always able to draw and paint. For many years, my immediate family thought I would go into art. When I was 14, I asked to talk to my dad and told him that I had made a decision to study astronomy. He, as always, encouraged me with my decision and told me he would support me in that decision.”

Kafatos graduated from a top Iraklion high school in 1965 and came to the United States to further his education. He received a B.S. in physics from Cornell, one of the most technical of the Ivy League colleges. From there, he was off to MIT for postgraduate studies, where he earned a Ph.D. in physics.

Along the way, he met and married his first wife. The marriage eventually fell apart, but not before producing three sons. Now grown, watching them as adults gives Menas Kafatos greater satisfaction than his many professional accomplishments. “None of them followed me into the sciences. My oldest son Leteris is a translator and language tutor in California; my second son Stefanos is a cinematographer and photography executive director of television programs. My youngest one Alexios is in retailing.”

After receiving his doctorate in 1972, he moved to University of Colorado, Boulder, to do post-doctorate work in astrophysics. After a year there, he went to NASA’s Goddard Space Flight Center in Greenbelt Maryland, where he pursued research for two years on a National Research Council fellowship.

In 1975 he became an assistant professor in physics at George Mason University, where he spent the next 33 years. At the time, he was studying physics associated with black holes – gravitational singularities caused by the collapse of stars. Much of his early work expanded our knowledge of the processes within some of the strangest points in our universe.

At George Mason Kafatos really demonstrated his aptitude at interdisciplinary science. Refusing to pigeonhole in astronomy and astrophysics, he began branching out.

In the 1990s, Kafatos collaborated with another professor at George Mason, Dr. Robert Nadeau, to work out a general philosophy of physics. Nadeau was a philosopher, not a physicist. The two of them attempted to reunite the two ancient disciplines. Their efforts culminated in two books: “The Non-Local Universe: The New Physics and Matters of the Mind” in 1990 and “The Conscious Universe: Parts and Wholes in Physical Reality” in 1999.

The result was intriguing and surprising. Some critics called the concepts presented Zen-like. Perhaps a more fitting analogy would be Platonic. It was a 20th century version of Plato’s allegory of the cave.

Infometrics also captured his attention. Infometrics is the study of the science of information and data, including information processing, large data set analysis and engineering of information systems. The ability to process information, to organize facts and obtain relationships between things is critical physics. It also underlies all scientific exploration. Kafatos became aware of the importance of infometrics as a result of his work in astrophysics.

Kafatos helped found the Institute of Computational Sciences and Informatics at George Mason to study computational science which focuses on modeling and simulations and informatics. The Institute, which later became the School of Computational Sciences, developed an international reputation, attracting students from around the world. Kafatos served as dean of that school from 2002 through 2006.

Kafatos moved further still from astrophysics, into space and Earth observations in general, when he helped found the Center for Earth Observation and Space Research (CEOSR) in 1995 within the
Since then he has focused on Earth observation, researching the connections between regional hazards and climate change. Today he spends much of his time on this topic, speaking about environmental issues throughout the world. "People talk about global warming," Kafatos states, "but what they do not realize is that the effects are felt locally." He is one of the most influential internationally known voices on the impacts of global climatic change.

He has added a new interest in his study of natural hazards: earthquakes. "Obviously, earthquakes are not caused by climate change," Kafatos says, "but the impact of an earthquake can be just as devastating as a major forest fire or hurricane." To further this new ambition Kafatos has taken a new position, at Chapman University in Orange, California, where he will pursue international collaborations, building computational science and projects on global change. He will be the vice chancellor for special projects as well as director of the Chapman's new Center for Excellence in Applied, Computational and Fundamental Science. He anticipates working closely with California agencies and private donors to pursue work that is environmentally important to society.

His personal life took a renewed turn when he married his second wife, Susan Yang, in 2006. A native Korean and a scientist herself, an expert in neuroscience and computational biosciences, she is now employed at Chapman University and will lead international relationships in the sciences. Together, they have found appreciation of each other's native country, Greece and South Korea, and their extended families, while living in their adopted country, the United States.

The National Herald asked Kafatos several questions.

**TNH:** Your professional interests include astrophysics, Earth observation and computers. They seem loosely linked. How did you get involved in so many different technical areas?

**MK:** Remember, I always seek new challenges. One thing that always bothered me was the tendency of many scientists to stick with one field and just work in, and eventually even die in it! I wanted to find the common elements in different scientific fields. To prove to myself, my own satisfaction, that I could excel in more than one field. Even though I had achieved certain name in astrophysics, particularly in black hole astrophysics, I started working in earth system science, and soon enough I achieved a name in that field as well. As for computational science, I developed it because it is the way of the future in science, an umbrella that ties different scientific fields together.

**TNH:** It is unusual for scientists to write books for a broad audience. You have done this several times. Why, and to what do you attribute your talents in communications?

**MK:** Maybe it is due to my artistic bend. I love books, and I love to write. Maybe it is the challenge of doing what most scientists cannot (or more likely will not) do. But I think it is the inner need to do and spread good around me, what my ways seeking my parental advice and guidance. And working with so many students and seeing them complete their studies. At the end, when they graduate, when they shake my hand or embrace me and telling me, "Thank you for everything." In both cases, it is the great feeling of guiding and loving the next generation. I guess the father in me shows through in both these aspects.

**TNH:** If you were just beginning your higher education, back in the 1960s, would you choose a different path? Explain your choice.

Menas Kafatos is with his family in 1950. In the back row are his brother Fotis, cousin George Mamangakis, and his brother Antonis. Menas stands in the middle of his mother Eleni and father Kostas.

School of Computational Sciences. Using satellites observations of the Earth, and combining the data gathered from orbital sensors with earth systems, information technologies, and innovative computational algorithm, the Center conducts research to enhance our understanding of Earth, its atmosphere, and space immediately around the Earth. It focuses interdisciplinary sciences on the study of the Earth. Kafatos serves as the first director of CEOSR.

Dr. Menas Kafatos remarried in 2006. His wife, Dr. Susan Yang, is a noted neurologist. He is pictured here at the wedding in Athens. His sons Lefteris and Stefanos acted as best men.

Menas Kafatos poses with his brothers in Greece in the 1950s. Fotis (back), professor at Imperial College in London, is an internationally renowned biologist. Antonis (right), a civil servant and businessman, lives in Athens. He says, "My two older brothers, Anthony and Fotis, always protected me and guided me."

Continued on page 23
Hellenic Medical Society of New York: Taking the Pulse of a Vibrant Future

By Antonia Callas
Special to The National Herald

It has been said that physicians, by nature, are committed to lifelong learning and the study of medicine is an endeavor that could fascinate and consume several lifetimes. Physicians of Greek ancestry, who have the richness of Hellenic heritage as part of their inheritance, often feel obligated to strive harder, be better and give of themselves generously. The idea logically presents itself as a continuum from Hippocrates ideals exemplifying a compassionate and humanitarian medical practice.

The Hellenic Medical Society of New York is a striking personification of these ideals. Its works of involvement, outreach and advancement, not just for those on the East coast, but for the Greek Diaspora worldwide are exemplary. HMS has diligently evolved since its inception and has put a local fraternity into a global, multi-directional society engaged in advocating for positive change in contemporary health care issues, thus ensuring a robust future for Hellenic leadership in medicine.

The Hellenic Medical Society’s genesis began in the First World War. It is fitting that the society was co-founded by the renowned physician Dr. George N. Papanicolaou, who, as Dr. Katherine Hajjar, chairperson of the Department of Cell and Developmental Biology at Weill Medical College states, “was very familiar with medicine as an endeavor that could fascinate and consume several lifetimes. Physicians of Greek ancestry, who have the richness of Hellenic heritage as part of their inheritance, often feel obligated to strive harder, be better and give of themselves generously. The idea logically presents itself as a continuum from Hippocrates ideals exemplifying a compassionate and humanitarian medical practice.”

The group was officially registered in 1920 as the Greek-American Intercollegiate Fraternity. In 1924, the Fraternity changed its name into the Greek-American Intercollegiate Club and under this rubric, broadened its scope.

A little over a decade later, under the leadership of Dr. Polybios Coryll, members of the Greek-American Intercollegiate Club broke off to form a separate organization comprised only of Greek-American physicians. Called the Hellenic Medical Society of New York, its original purpose included cultivating fraternal relationships among its members and assisting in the preservation of public health in conjunction with other medical societies.

If one wishes to sort through the tangled vines of the many Greek organizations that have germinated, grown and flowered over the years, the Intercollegiate Club itself changed its name in 1945 to the Hellenic University Club of New York, the name by which it is presently known.

At first, HMS planned on creating a network of Greek American physicians and assisting in the preservation of public health in conjunction with other medical societies. However, time, change, and the Second World War saw membership dwindle. By the mid-1960s, the organization had about 20 members, and its activities were primarily social.

Then, in 1967, HMS began to re-purpose itself. Galvanized under the leadership of president, Dr. Theofilos Delyianides, the organization rewrote its constitution, recruited new members and saw the beginning of fundraising events for the educational of Greek physicians. HMS has not looked back since.

Dr. Marinos Petratos, president from 1975 to 1977, a gregarious and energetic man explains, “Still, we realized something had to change, we needed a bigger objective. The idea of creating a scholarship was conceived. The group wanted something that could carry the society through the future and create a permanent and lasting legacy. Petratos chuckled in recollection, “The first year we awarded two scholarships, each for $500! We are currently awarding 30 to 40 a year, so we’ve come a long way.”

Currently HMS Scholarship Funds grant valuable financial and medical resources to talented students and physicians. The scholarships provide the very important function of strengthening the ethnic and cultural bonds of Greek heritage. HMS awards approximately $50,000 in scholarships each year. At this time, scholarships are granted to American students of Hellenic descent but HMS has granted several international scholarships as well and may possibly increase that number in the future.

The awards include the HMS Medical Student Scholarship, which is granted to medical students from New York, New Jersey, Connecticut and Pennsylvania; the Leonidas Lantounis Research Grant, awarded to students for research in the biomedical sciences; the Michael Mulinos Postgraduate Award, awarded to postgraduate students; and the Christ Bozes High School Medical Essay Prize, which awards $500 grants to high-school students from across the United States who are planning on going into medicine.

In addition, there are named funds and scholarships in honor of physicians and colleagues: The Angelanakos-Gabriel Memorial Scholarship, the Theodore and Evelyn Chengelis Memorial Scholarship, the Polybios N. Coryll Memorial Scholarship, the Flessas Memorial Scholarship, the Anthony and Joyce Kales Scholarship, the Lignos Scholarship, the Nicholas Memorial Scholarship, the Kotilimbas Memorial Scholarship, the Stefanides Scholarship, the Vardopoulos Scholarship, the A. Vailas Scholarship and the HMS/Comell Papanicolaou Scholarship which is presented at the annual Papanicolaou symposium.

The scholarships are given at the Annual Scholarship Weekend Celebration held in December. This year’s 72nd annual celebration will be held over the weekend of December 5th & 6th. The festivities begin with a Friday evening cocktail reception, scientific exhibits, a two-hour scientific symposium and the presentation of the HMS Scholarship and Awards to the recipients. On Saturday evening, HMS will hold a Gala Dinner Dance at the Rainbow Room of Rockefeller Center honoring distinguished Hellenes. The honorees for 2008 are as follows: Distinguished Physician: Christopher J. Logothetis, M.D., professor and chairman, Genitourinary Medical Oncology Center and director, Genitourinary Program, University of Texas M.D. Anderson Cancer Center, Houston, Texas; Distinguished Hellene: Antonios A. Dia- mataris, publisher/editor, The National Herald; Esteemed Colleague: John Kampessis, M.D.

The scholarships have another important function. They are a way to energize the community and inspire medical students to start Medical Societies in their own cities up on graduation. “Most societies outside of New York were started by students that have received scholarships and liked the idea of HMS,” says Petratos.

Hellenic Medical Societies in cities across the United States operate under the umbrella of Federation of Hellenic Medical Societies. They include: Chicago/Midwest, Los Angeles, Boston, New Jersey, Philadelphia, Washington D.C., Toronto, Ontario, and Montreal, Quebec. There are currently initiatives underway to form Societies in South Carolina, New Mexico and Houston. However, the New York Society is the most active and far-reaching of any in existence.

When HMS was first formed, it was mainly comprised of medical graduates from Greece who came to the United States and stayed on. As the society has grown and its population slowed considerably, it now attracts many Greek American students who are graduates of American universities. Membership is younger as well and as 50 percent of medical students are now female, the number of women members has...
Greek American Scientists

In 1997, a tree was brought from the island of Kos by Dr. Anthony Vasilas and was planted at New York Presbyterian Hospital of Cornell University in honor of Dr. George Papanicolaou. It replaced the one destroyed during a previous expansion program of the hospital. In 1920, Dr. Papanicolaou was the first president of The Hellenic Medical Society of New York (then known as the Greek-American Medical Fraternity). He became renowned for the development of the Pap test, a method of detecting cervical cancer.

Greek Health Minister Demetris Avramopoulos (left) presents Hellenic Medical Society of New York president, Dr. George Dangas, with a likeness of Hygeia, the ancient Greek goddess of health at HMS’s 70th Annual Scholarship Gala held on December 2, 2006. Avramopoulos affirmed the Greek Government’s commitment to the development of joint initiatives to help bring the Hellenic American medical community closer to Greece and Greeks living abroad.

The Founding Forum of the Global Hellenic Medical Network was initiated by Greece’s Health and Social Solidarity Ministry and was held on the island of Kos, in 2006. It was organized in cooperation with the Hellenic Medical Society of New York, the Federation of Hellenic Medical Societies of North America and the Hellenic Academy of Medical Training, based in Athens. Representatives of medical associations and working groups from four continents were present and over 200 attendees acted towards a declaration of common interests and missions.

This past September, HMS was pleased to participate in the biennial World Hellenic Biomedical Association (WHBA) symposium, held in Cyprus. WHBA’s goal is to bring together global Hellenism in the areas of medicine and biomedical engineering.

The Global Hellenic Medical Network also held their conference in conjunction with the WHBA, where their participation was most welcome.

Dangas has also worked diligently to expand interaction with the Greek medical community. He travels to Europe frequently, meeting with various groups such as the Central Health Council in Athens (KESY), the dean and vice-dean of Athens Medical School, the MIT and Stanford alumni clubs in Athens, and the president of the WHBZ, Gabriel Panayi, in London.

Dangas has established strong ties to Minister of Health Dimitris Avramopoulos, who, in turn, has repeatedly visited HMS in New York and actively supported the organization with a monetary grant from the Greek government – a first for any professional society abroad.

This past summer, the Greek Ministry of Health invited HMS and the Global Hellenic Medical Network to participate in the “pre-Olympiad” conference in Beijing, China. A three-member delegation attended and participated with the Greek and Chinese Health Ministries.

Whether working on naming a section of a street at Cornell Medical College, “Dr. George Papanicolaou Way,” or connecting the Hellenic medical profession on a world stage, HMS has proven it is far-sighted and diligent in creating a strong foundation that will build long-lasting roads to the future.

Antonia Callas is a freelance writer based in Chicago. Her work has appeared in a variety of Hellenic newspapers and magazines throughout the country. She is currently attending DePaul University and will receive her Bachelor of Arts in 2009.
The Library of Life: Dr. Tom Maniatis and Molecular Genetics

By Marianthe Karanikas
Special to The National Herald

1944, when Dr. Tom Maniatis was 10 years old, Dr. Oswald T. Avery, Dr. Colin MacLeod and Dr. Maclyn McCarty discovered that the gene, the basic unit of heredity, is made of DNA or deoxyribonucleic acid. In 1953, when Maniatis was 10 years old, Dr. James D. Watson and Sir Francis Crick discovered the “secret of life,” that is, the structure of DNA or the double helix. The double helical structure allowed Watson and Crick to propose a model for how genes are replicated and passed onto subsequent generations, and how the information encoded in DNA can be translated into proteins. At that time, Pete and Jane Maniatis knew nothing of such matters. Nor did they know their young son would one day work alongside Watson, Crick, and other molecular biologists to discover secrets that would lead to major medical advances.

Maniatis and his research team were the first to isolate a human gene, specifically the human hemoglobin gene. This research approach helped scientists pinpoint the specific genetic mutations that cause thalassemia, an anemia prevalent in Greece and parts of Italy. Maniatis’ lab went on to produce the first “library” of human genes. Subsequently, researchers used these molecular approaches to identify the genetic basis of many other diseases. Maniatis’ contributions did not stop there. He co-authored a manual on recombinant DNA technology that has trained generations of students throughout the world. In addition to his academic research, Maniatis co-founded three biotechnology companies, which produced several FDA-approved drugs.

In addition to his academic research, Dr. Tom Maniatis co-founded three biotechnology companies, which produced several FDA-approved drugs.

In 1971, at Vanderbilt University and at the Medical Research Council of Molecular Biology in Cambridge, England, at Harvard University and the Medical Research Council of Molecular Biology in Cambridge, England, at Harvard, he worked with Dr. Mark Ptashne on how proteins bind DNA during gene regulation in a virus called bacteriophage lambda. At the MRC, he worked with Dr. Fred Sanger on determining a sequence of DNA in a regulatory region of the viral DNA.

What is the lambda bacteriophage and why is it important? Lambda “phage” is a virus that infects E. coli bacteria. Lambda phage has a head and tail made of proteins, and the DNA is tightly packed inside. Through its tail, the phage injects its DNA into a bacterium. The phage replicates its DNA, degrades the E. coli DNA, and takes over the cellular machinery of the bacterium in order to produce as many phage particles as possible. Lambda phage has been used widely as a model organism to study gene regulation and protein-DNA interactions. It has also been used to clone recombinant DNA.

What does that mean? Recombinant DNA is produced by combining DNA sequences that would not normally occur together, for example a piece of human DNA can be inserted into the viral DNA and propagated in bacteria. Why do such a thing? A major reason is to isolate and study specific genes or sequences of DNA. Cloning genes makes it possible for scientists to purify and make many copies of specific genes. Recall that the lambda phage DNA makes many copies of itself inside the bacterial host. When scientists insert a gene into the lambda phage, they can then use the phage’s ability to replicate to make many copies of the inserted gene for detailed studies. Why make these copies or clones? One important use of the cloning of specific genes is in gene therapy, where genes are inserted into the cells and tissues to treat disease.

Following his postdoctoral work at Harvard and the MRC, Maniatis became a senior staff investigator at Cold Spring Harbor Laboratory in New York at the invitation of Dr. James D. Watson. Here Maniatis and his coworkers developed a new method of cloning, which begins with RNA instead of DNA. Recall that DNA is transcribed into RNA and then translated into protein. Maniatis and his lab converted RNA...
transcripts back into DNA and then made copies or clones of this complementary DNA or cDNA. Maniatis’ lab used this method to obtain the cDNA of the RNA that encodes hemoglobin. This cDNA cloning method allowed scientists to produce RNA transcripts of any gene. It also helped scientists pinpoint the genetic mutations that cause thalassemia, a disease caused by mutations in the gene encoding hemoglobin.

From Cold Spring Harbor, Maniatis moved to the California Institute of Technology where he and his lab worked on cloning the DNA of genes rather than the RNA transcripts. Here they produced the first “library” of human genes, a major advance in gene research. Using this library, scientists were able to isolate virtually any human gene. This “library” approach was instrumental in the human genome project, which later led to the determination of the sequence of the entire human genome.

In 1981, Maniatis returned to Harvard as professor of biochemistry and molecular biology. He served as department chairman from 1985 to 1988. He is currently the Jeremy R. Knowles Professor of Molecular and Cellular Biology.

FROM GENE LIBRARIES TO BIOTECHNOLOGY


Genetics Institute produced several FDA-approved drugs and was taken over by Wyeth Pharmaceuticals in 1994. At Genetics Institute, scientists were able to help people with hemophilia lead normal lives. Hemophilia is a genetic disorder in which critical proteins necessary for blood clotting are not produced. Previously, these patients were treated with crudely fractionated blood products that were often contaminated with viruses, such as HIV. Thus, many hemophiliacs patients contracted AIDS. Because the clotting factors are present in such small amounts in human blood, it was not possible to obtain pure proteins.

To solve this problem the Genetics Institute scientists cloned the genes encoding the clotting factors and then reinserted them into specially designed cells that could be used to produce the clotting factors in large amounts in the laboratory,” Maniatis told a reporter from The Harvard Gazette. “Thus, highly-purified clotting factors could be made from a source free of any infectious agents.”

“Scientists at the Genetics Institute also discovered a bone morphogenetic protein, which is now used routinely in bone reconstruction and bone healing,” Maniatis told me.

At ProScript Pharma, scientists developed the FDA approved drug, Velcade, which is used to treat multiple myeloma, a cancer of cells in the bone marrow that produce antibodies. Velcade can help prolong the lives of these cancer patients by slowing the spread of the cancer.

“At a charity event, a woman thanked us for giving her father four more years of life with Velcade,” Maniatis said. “It’s very gratifying to help people.”

ProScript Pharma was taken over by Millennium Pharmaceuticals in 2001. Acceleron Pharma, meanwhile, remains a privately held biotechnology company developing drugs for the treatment of diseases of the bone and muscle.

THE POWER OF FAMILY HERITAGE

Maniatis has visited Greece several times, once to receive an honorary doctorate from the University of Athens. He loves the friendliness and the warmth of the Greek people. Like most Greeks and Greek Americans, Maniatis cherishes his family. His parents, Pete and Jane, were married for over 65 years. They both died in 2006. Maniatis enjoys spending time with his two sons, Ethan and Silas, from his first marriage to Jessie Klyce.

Ethan lives in Belmont, Massachusetts. A Harvard graduate, he is currently a pilot for Jet Blue Airlines. “I find it interesting that my son Ethan is a pilot,” Maniatis said. “Perhaps it has something to do with our Greek heritage. A disproportionately high number of Greeks from the Mani go into the Greek air force.”

Silas lives in Cambridge, Massachusetts. He graduated from New York University and is currently a Ph.D. student in molecular and cellular biology at Harvard University. “Silas is studying the role of microRNAs in learning,” Maniatis said.

MicroRNAs are very short RNA molecules, which regulate gene expression. Silas Maniatis is working with Dr. Sam Kunes whose research focuses on the development and function of the nervous system. Maniatis’ passion for research unites with love for his family. His only sister, Carol, died in 1998 from ALS. Soon afterward, Maniatis was asked to help find a cure for this usually fatal, neurodegenerative disease.

When most people are asked to help find a medical cure, they donate money, certainly a valuable gift. Maniatis, however, went a step beyond. Together with scientists at Harvard and Columbia, Maniatis discovered a major breakthrough in ALS research.

A REMARKABLE TRIBUTE

ALS is caused by the degeneration of motor neurons, the nerve cells that control the voluntary movement of the muscles.

“It’s very exciting,” Maniatis said. “We’re using stem cells to study the development of the disease.”

Some background is necessary to understand the significance of Maniatis’ findings. First, remember that neurons or nerve cells in the central nervous system are supported by cells called glia, from the Greek word for “glue.” Glial cells also provide neurons with nutrients. The glia outnumber neurons by about 10 to 1. Maniatis’ lab is focusing on the role of astroglia in the development of ALS. Astroglias are just what their name suggests: star-shaped glial cells that support motor neurons in the brain and spinal cord.

Second, recall the importance of embryonic stem cells. These cells are pluripotent, which means they can develop into any kind of cell in the body.

Using embryonic stem cells from mice, Maniatis and his collaborators grew mouse motor neurons and mouse astroglia that were afflicted with ALS. And the researchers discovered a most shocking secret: the diseased astroglia secrete a toxic factor that kills both healthy and diseased motor neurons. The scientists are now working to identify this toxic factor.

“We’ve opened up a new direction in ALS research,” Maniatis said.

This research is a remarkable tribute. What better way for a brother to honor the memory of his sister Carol? Maniatis and his colleagues may help pave the way toward a cure for ALS.

Dr. Marianthe Karanikas teaches scientific and technical writing at Missouri State University where she is associate professor of English.
Stamatios Krimigis: Argus of the Space Age

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TNH: Which of your accomplishments left you with the greatest sense of satisfaction and pride?

SK: My work on the Voyager missions. It was the premier scientific space mission of the 20th century. Voyager visited four planets and is now in interstellar space. I have been working in it for 40 years, and am still getting data and writing papers about the science. I could not ask for anything better. With all the discoveries, it was just fantastic.

TNH: What was the biggest challenge you ever faced, and how did you meet it?

SK: It was when I was a scientific manager, rather than as a scientist, during the NEAR mission to the asteroid Eros. We got it to Eros, and lost the signal after doing the maneuver. It disappeared for 26 hours. People were still skeptical about cheap planetary missions. We needed the mission to succeed.

It was really a challenge, but we recovered the spacecraft. There was a subtle software problem communicating between the attitude control and the spacecraft computer. I could see how the program people would become demoralized, but I kept the team going until we found a solution and recovered the satellite. It was a big payoff that demonstrated low-cost missions were possible.

TNH: How do you feel your Greek heritage has affected your life?

SK: Through its emphasis on achievement and the pride of pursuing excellence. I remember reading the oration of Pericles in Thucydides’ History of the Peloponnesian War. He talked about the pursuit of excellence. When I read that, I thought I had to pursue excellence.

The space frontier opening up was a terrific opportunity to push boundaries and explore new things. I wanted to do the best possible that I was capable of.

A sense of history is another element of being Greek. I felt I had a special responsibility to pursue things with a long-lasting impact.

TNH: What is the best part about being American?

SK: America makes it possible for people of determination and talent to succeed. Meritocracy is what is practiced and what makes it great. Its democracy and democratic values are also special, the process by which we choose leaders. Leaders have to demonstrate why they should be our leaders. It tests their mettle. I cannot imagine leaders elsewhere doing this or going through this process.

TNH: If you could visit anywhere – on Earth, or in the solar system – past or present – where would you go?

SK: Jupiter is my favorite planet. It has the right name. It is the king of planets. There is terrific scenery there, both in Jupiter’s atmosphere and on the moons of Jupiter. On Io there are always 10 to 15 volcanoes erupting. Europa has an icy surface. God alone knows what materials are under that ice crust.

If I could go anywhere, I would take a trip there and walk around on its moons. Jupiter’s high radiation would make it impossible to really do that. You would get cooked in six hours. It is fun to do it in my imagination.

TNH: If you could not be a scientist, what would you be?

SK: I became friends with Vangelis Papathanassiou at one point, the composer that wrote the score for the movie “Chariots of Fire.” I was fascinated by the way he was inspired by music, playing the compositions in his mind. I sometimes wonder what it would be like to be a composer.

TNH: What advice would you offer anyone starting out in life today – people in their late teens?

SK: Do the best job possible in whatever they decide to do as a career. Success is its own reward. It does not come unless you prepare. You have to work as hard as you can with absolute integrity and honor.

Professor Christos Papadimitriou: Embracing the Past, Navigating the Future

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work. The other fascinating aspect of this story is that the majority of the ingenious mathematicians who pursued this dream had painful bouts with mental illness.

TNH: You’ve lectured on the subject of mathematics and narrative. What draws you to the intersection of these disciplines?

CP: My love and mission in life is to teach. It’s really humbling for a moment for an academic to realize that language may have existed for around 50,000 years, yet organized education has been around for only 1,000. What was happening before? Well, for the longest period, knowledge was transmitted through story. Storytelling was the only way of transmitting cultural information. That was good, because stories are sticky. You’re much more likely to remember a story than an argument. So, I have been trying in my teaching to inject some of this. I often interrupt to tell a story, either to illustrate a technical or mathematical point, or to tell about the life of a pioneer who brought the idea to us, and I think these are the moments my students enjoy the most.

Nile Southern is a writer and filmmaker living in Boulder, Colorado. His book: “The CANDY Men; The Rollicking Life and Times of the Notorious Novel, CANDY” (Arcade, 2004), was awarded ‘Book of the Year’ for non-fiction, from the Colorado Center for the Book. His latest project is a radio series entitled “Greeks Out West; From Byzantium to Bingham Canyon and Beyond,” a project which seeks additional funding. Contact: nile@explodinglimo.com
Prof. J. Kakalios: Superman in Disguise

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the human body's operation, he returns to our hero, stating, "Ant-Man can indeed punch his way out of paper bag." The author ends this section in a typical humorous mode: "In this way he (Ant-Man) serves as a role model and inspiration to all comic-book fans."

Kakalios serves as a role model and inspiration to me. He is a modern Superman whose powers generate from his intellect and creativity. He says, "If the study of the natural world has demonstrated anything, it is that, unlike the Hulk, the smarter we get, the stronger we become .... It is our intelligence that provides the competitive advantage that enabled us to become the dominant species on the planet. It is our intelligence that is our superpower."

Dr. Elaine Thomopoulos writes about the Greek American experience. She is curator of the exhibit, "The Greeks of Berrien County, Michigan," now on permanent display at the Annunciation and St. Paraskevi Greek Orthodox Church in New Buffalo, Michigan.

The Fundamentals of our Universe: Dr. Vaia Papadimitriou Strives to Answer Eternal Questions

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ties, science becomes real to children and in many cases, more interesting and accessible. For older children or adults interested in learning more about physics, Papadimitriou also encourages reading the magazines Physics Today and Scientific American.

When asked what is on the horizon in particle physics, Papadimitriou noted that the race is on to find the Higgs boson as well as to search for other new particles and resonances expected or unexpected (dark matter particles, supersymmetric particles, extra dimensions, etc.). The Higgs boson is the particle that has eluded physicists for a generation and according to the Standard Model of understanding physics, it endows elementary particles in the universe with mass. Finding it could unlock knowledge of new realms of nature. In August, Fermilab reported that it came one step closer to understanding the nature of the Higgs, but it has not yet been found and still presents one of the most exciting next steps in field. The search for the Higgs will soon become even more intense when the large Hadron Collider starts operations at CERN in Switzerland.

In talking with Papadimitriou and preparing this article, this writer was reminded of what an amazingly intricate and complex world we live in. There is such depth beneath the layers of what we see. It is humbling and awe-inspiring. This writer is grateful to Papadimitriou and to all like her who push the frontiers of science to deepen our understanding of the origins of our universe, and in doing so, create technologies that enhance and advance our lives.

Penelope Petropoulou graduated with a bachelor's degree in history from the University of Chicago. She works in alumni relations at the university and enjoys traveling, writing and entertaining family and friends.

Dr. Leda Cosmides

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Cosmides and her husband John Tooby, reside in Santa Barbara, California. They have one daughter, Nike Tooby Cosmides, named after Winged Victory, the Titan who helped Athena win her battles. Early on, Cosmides and Tooby decided that if they had a boy, the child would share Tooby’s last name and if they had a girl, the child would share her surname. At the age of ten, Nike aspires to be a fashion designer.

John P. Psiharis is president of J. Psiharis & Associates, Inc, and co-owner of Little Helpers, Inc. Both are Chicago area businesses. He is a founder and former executive director of Greek-American Community Services and a founding member of the Greek-American Nursing and Rehabilitation Center located in Wheeling, Illinois.

Menas Kafatos: Solving the Labyrinth

Continued from page 17

THN: How do you feel your Greek heritage has affected your life?
MK: It is so much of who I am. I am not just proud of my heritage, in a deep way, but I continue to discover what is so great about being of Greek origin, which is to be able to adapt and still be a human being. What the Greek heritage is really in the end is the universality of humanity. At the bottom of it all, what sums up everything about Greece, then and now, is the value of humanity. Greece brings out the best in humanity, I really believe that.

THN: What is the best part about being American?
MK: The foundation of America is democracy, freedom and humanity. All founded in Greece. So the best in America is the best of Greece.

TNH: Any hobbies or passions outside your work?
MK: Reading books, swimming, skiing and listening to music.

THN: If you could not be a professor or a scientist, what would you be?
MK: Clearly an artist.

TNH: What advice would you offer anyone starting out in life today — people in their late teens?
MK: We have huge challenges in front of us, having to do with climate change. I would urge them to study and follow what is happening to the environment — their well-being and even life, literally, depend on it.

Mark Lardas, a Texan of Greek descent, was born and grew up in Ann Arbor, Michigan. An engineer who works at a major aerospace company, he is also a freelance writer, amateur historian and model-maker.

Dr. Vaia Papadimitriou is a particle physicist at Fermilab in Batavia, Illinois. Papadimitriou is the assistant division head of Fermilab’s Accelerator Division and a member of the CDF (Collider Detector at Fermilab) experimental collaboration.