

# Engineering & Physics Club NEWSLETTER

Fall 2005

**"Whether you think that you can, or that you can't, you are usually right."**

- Henry Ford (1863-1947)

**"Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away."**

- Antoine de Saint Exupery

**See the latest Puzzler on page 3**



## Meet Bob Sompolski, Dean of Math and Technologies

by Davy Murukurthy



Though we were sorry to see Dean Kotowski step down, it is good to know that the position is being filled by Bob Sompolski.

Bob has a B.A. in Math (I.I.T.), an M.S. in Math (U.I.C) and a Ph.D. in Math and Computer Science (U.I.C). He has been with Oakton for 15 years and Chair of Math and Computer Science for three years, and has taught Algebra, Linear Algebra, and Programming. Prior to Oakton, Dean Sompolski worked at Argonne National Laboratory and with a software developer on UPS (uninterrupted power supply) systems.

Our Dean has been happily married for 18 years and has a daughter in high school. He loves to cook, he plays the piano and flute, snowboards with his daughter, and swims.

Dean Sompolski did not apply for this job; he was asked to fill the position on an interim basis. He commented on how rewarding and challenging the job is. His lack of Physics and Engineering background is offset by his willingness to reach out and ask for help from those around him. The response from the faculty has been very positive. Bob feels like a coach surrounded by great team players. On a final note he said, "My door is always open to faculty, staff, and students." Let's all welcome Dean Sompolski!

## COMING: FALL 2005 MATH COMPETITION!

***In fall 2004, Oakton ranked 2nd in the Midwest region and 33rd in the country and in spring 2005, Oakton ranked 3rd in the Midwest region and 27th in the country!***

The **Fall 2005 Math Competition** will be held on November 2, in Room 1608/1610 from 1:00 – 3:00 p.m. Participants should bring picture ID, calculator, and pencils. Level of competition: Precalculus.

Every Oakton student is welcome to participate. Students who have classes until 1:50pm can be admitted at 2:00pm. The earliest time that a student can leave the competition room is 2:05pm. Students are permitted to use any scientific or graphics calculator, provided they do not have a keyboard (such as, for example TI-92) or a disk drive. However, no books, mathematical tables, computers or questions are permitted during the test.

For more information about the competition, awards and sample tests, and contacts, please visit the official website: <http://servercc.oakton.edu/nsf-stem/Competition/math-competition-2005fall.htm>

## Bridge Building Contest Winner

*Rose Sadleir (far right) holds her winning design – before testing – in the bridge building contest held this summer.*

It took 160 lbs to destroy a bridge that weighed only 68 grams! That's the load-to-weight combination that made Rose Sadleir the undisputed winner of the bridge building contest held July 21<sup>st</sup> in the ENG 217 Mechanics of Materials class. Sixteen contestants had built bridges of their own design from hard pasta (bucatini # 14), to rigid specifications. The bridges were measured, weighed, and then loaded to the breaking point. The load-to-weight ratio of Rose's bridge was the highest: 160 lb x 453.59 grams per lb divided by 68 grams = 1067.27.

The contest was open to all Oakton students, and will be repeated next summer.



## William James Sidis: Child Prodigy

By Todd Nudelman



**“At eight years of age he had already written four books and was fluent in eight languages.”**



**The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'That's funny...'**

- Isaac Asimov

William James Sidis was born 1898, in the United States. His Parents, Boris and Sarah Sidis, emigrated from Russia to escape persecution during a time of anti-Semitic acts of violence. They dedicated their lives to their son's early development, determined to forge genius qualities in young William James. In this they succeeded.

Young Sidis could speak at six months, and was able to read at eighteen months. At eight years of age he had already written four books and was fluent in eight languages. As a nine year old he hosted a seminar on the fourth dimension at Harvard University, where he enrolled two years later. Graduating at the age of sixteen, he went to Rice University to teach Mathematics. Students ridiculed young Sidis because of his youthful ways, and he decided to go back to Harvard and study law.

Sidis was arrested in 1918 during a communist anti-war rally. While imprisoned the media's fascination with William James grew tremendously. He was exploited by the press and ridiculed by his own colleagues. Sidis drove himself to isolation, abandoning his work in mathematics. He told the press "The only way to live the perfect life is to live it in seclusion." The impact of society's intrusion on his life left him starving for privacy. Living in seclusion was the young genius's rebellion against his parents, and all the stress and restraints from the world's high expectations of him.

In 1944, at the age of 46, Sidis died of a cerebral hemorrhage. According to his biographer, Amy Wallace, during his whole life Sidis rejected sex, art, music, and anything else that connected him to the unwelcoming world outside his own mind. During the last years of his life, Sidis devoted himself to his hobby, collecting streetcar transfers.

Though some may consider Sidis a "burned-out failure" and victim of a high IQ, this does not diminish the importance of his work. Few of his writings have been published, many have been lost. Two of his most prominent works contain very controversial, original thought.

In 1925, one of his most well known writings was published, *The Animate and the Inanimate, A General Theory of the Phenomena of the Universe Based on the Theory of Probability*. This book explains his theory that the universe is infinite and eternal; it did not begin at a particular time, and will not end at a particular time, disproving the "Big Bang" theory. "Among the physical laws it is a general characteristic that there is reversibility in time; that is, should the whole universe trace back the various positions that bodies in it have passed through in a given interval of time, but in the reverse order to that in which these positions actually occurred, then the universe, in this imaginary case, would still obey the same laws."

*Continued on page 4*

## Book Corner

***The Man Behind the Microchip: Robert Noyce and the Invention of Silicon Valley* by Leslie Berlin**

**Hardcover, Oxford University Press (June, 2005), 402 pages, ISBN: 0195163435**



Robert Noyce (1927 – 1990), has been considered the Thomas Edison and Henry Ford of Silicon Valley. Berlin's highly acclaimed and well-rounded bio brings to light a giant of the high-tech revolution.

Credited with creating both Fairchild Semiconductor and Intel (a co-founder of both), Robert Noyce was a complex and fascinating man. The son of a preacher, Noyce was raised in Iowa. He majored in physics at Grinnell College and later went to M.I.T. where he learned more about transistors than many of his professors. At Fairchild he invented the integrated chip and revolutionized the semiconductor industry. In 1968 he founded Intel and invented the microprocessor. At both companies he introduced the casual work environment, now associated with the industry in California. There is much to learn from this brilliant inventor, entrepreneur, and risk taker.

During a recent book discussion, the author stated that many of Noyce's friends and colleagues broke down and cried during interviews, such was the impact of this man.



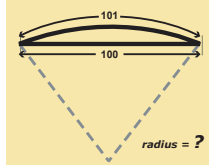
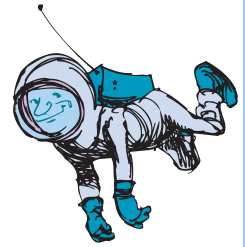
**"If I had thought about it, I wouldn't have done the experiment.**

**The literature was full of examples that said you can't do this."**

**- Spencer Silver on the work that led to the unique adhesives for 3-M "Post-It" notepads.**

## The NEW Puzzler:

In order to train for weightlessness, potential astronauts are flown on air force transports. The pilot flies the aircraft over an arc at high altitude, so that the centripetal force equals the gravitational pull. The astronauts can then release their seatbelts and "float" in the cabin for some time. If the aircraft speed is 1000 km per hour what is the radius of the flight path? If the pilot cannot deviate more than 2000 feet in elevation, how much "floating" time do the astronauts have?

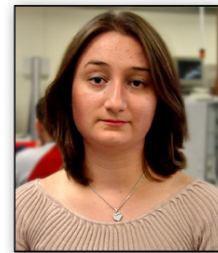


### Answer to the last Puzzler:

**R = 206.885**, solution via *Mathematica* and from [mathworld.wolfram.com](http://mathworld.wolfram.com)  
For detailed solution contact George Tootelian: [gtoot1@comcast.net](mailto:gtoot1@comcast.net)

**Congratulations to the Winners of this Puzzler:** Steve Martin (student), Roy Euclide (faculty), David Fisher (lab assistant), and Marc Pavlik (lab assistant).

## The Engineering and Physics Club Officers



From left: **John Kalinowski** (President), **Davy Murukurthy** (Vice President), **Todd Nudelman** (Treasurer), and **Milja Pekic** (Secretary). Todd is new on board this semester (see page 3, "New Energy Project Team").

## CORLIOLIS FORCE (Katrina explained?)

By Bob Whitman

I would like to make a few comments about the Coriolis Force for those people who have problems picturing it. This is the force responsible for clockwise airflow about a high-pressure area and counterclockwise flow about a low-pressure area in the Northern Hemisphere (and the opposite in the Southern Hemisphere).

It involves the fact that air molecules at rest on the earth are moving at a high velocity, when viewed from a point fixed in space above the earth's surface. This is because of the earth's rotation on its axis, with the fastest moving molecules at the equator, where the radius of rotation is equal to the earth's radius, and the slowest (0 velocity) at the N and S poles of the axis of rotation (where the radius of rotation is 0). (If  $\omega$  is the angular velocity of rotation, and  $r$  is the radius of rotation, then the particle velocity  $v = r\omega$ ).

Now, if a fixed air molecule in the Northern Hemisphere is induced to move Northward, the outside observer would say that the particle finds itself in a region with a smaller radius of rotation ( $r_1$ ) and a group of particles moving more slowly ( $v_1 = r_1 \omega$ ). The particle (with original velocity,  $v_0$ , and original radius of rotation,  $r_0$ , mass,  $m$ , and angular momentum  $M = r_0 m v_0$ ) also is forced to increase its velocity even further to conserve angular momentum. The net result is that the particle is moving faster in the direction of rotation (East) than all the particles around it, or from the point of view of the fixed particles on the rotating earth, the particle is moving East. Likewise, a particle induced to move Southward will start moving West.

Note that a high-pressure area forces air molecules away from it, just as described above. If a point has particles North of it moving Eastward and South of it moving Westward, it is considered to be in the center of a clockwise rotation.

Since the particle changes velocity or accelerates as it moves North or South, a force is involved, and this force is called the Coriolis Force. (Note that the linear momentum  $mv$  increases as the particle moves North. This implies an increase in energy,  $\frac{1}{2} mv^2$ . It can be shown that the work done by gravity in pulling the particle to a smaller radius against centrifugal force is equal to the gain in energy.)

More generally, it can be said that the Coriolis Force causes all particles moving in the Northern Hemisphere to be pushed to the right. The explanation for particles moving East and West can be attributed to the resultant unbalance between centrifugal force and gravity, as projected on the Earth's surface (in a somewhat more complicated description). (The Coriolis acceleration is mathematically described as the cross product  $-2(\omega \times v_b)$ , where  $v_b$  is the air molecule's velocity as seen on the rotating body).



**"If everything seems under control, you're just not going fast enough."**

- Mario Andretti

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*The views and opinions expressed on these pages are strictly those of the authors. The contents of these pages and the links therein have not been reviewed, approved or endorsed by Oakton Community College.*

## **Child Prodigy** *Continued from page 2*

Another one of his most significant writings was published in 1935, *The Tribes and the States, 100,000 Year History of North America*. In the first portion of this book Sidis portrays American history as documented by the Wampum tribe. Needless to say this caused much controversy at the time it was published, but shows much about the insight and personality of William James Sidis.

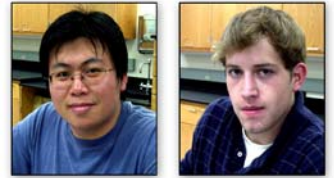
Sidis's last documented writing was letter dated July 12, 1944, and addressed to "Whom It May Concern." The following is a portion of that letter: "According to current and dire statistics, many of those in spiritual and civil positions of power today have truly lost their feeling for the human family. Companies continue to strip mine the earth of gifted humans and material resources with total disregard and disdain for the well-being of the earth and humanity in general. End the struggle within your magnificent mind. It is time for you to come out from behind the veil and begin to exercise your influence as an advocate of humanity"

Wallace, A., *.The Prodigy: A Biography of William James Sidis, America's Greatest Child Prodigy*, New York: E.P. Dutton, 1986.

Sidis, W.J., *The Animate and the Inanimate*, Boston: R.G. Badger, 1925.

## **New Energy Project Team**

Ji Hoon Jeong (left) and Todd Nudelman (right) are looking for creative persons to join their design team on several projects. If you are interested in problem solving, building, and designing, including using Oakton's new Rapid Prototype machine, contact Todd ([tnudelman@aol.com](mailto:tnudelman@aol.com)) or Ji Hoon ([ultrajih79@yahoo.com](mailto:ultrajih79@yahoo.com)).



Todd is our new Engineering & Physics Club Treasurer. He is a member of the Honors Society, and Phi Theta Kappa. A full time student with a full time job, he plans to attend University of Illinois, Champagne Urbana, fall of 2006 to study mathematics and science. As treasurer of the Engineering and Physics Club Todd promises to not only provide financial precision, but hopes to inspire ingenuity amongst all other club members so that this year the Engineering and Physics Club will become more active in projects, and promotion than any preceding year.

Ji Hoon, from Korea, has been in the U.S. only six months. At first, Ji Hoon knew very few people and was not sure how to use his free time between classes. He soon realized many international students were in the same situation, and did some research. Ji Hoon felt there is not enough information for international students and therefore they don't get as involved in school activities. As an international student advisor, he hopes to introduce foreign students to the Engineering & Physics Club because he also wants a chance to meet, talk, and study with other students.

## **UPCOMING EVENTS**

### **FALL 2005 MATHEMATICS COMPETITION**

**Wednesday, November 2, 2005, 1:00 – 3:00 PM**

Level of Competition: Precalculus

Please bring: Picture ID, calculators, and pencils

Every Oakton student is welcome to participate.

**For more information about the competition, awards and sample tests, please contact Dr. Wang at 847-635-1751 ( [tingxiu@oakton.edu](mailto:tingxiu@oakton.edu) ) or visit the website:**

<http://servercc.oakton.edu/nsf-stem/Competition/math-competition-2005fall.htm>

### **The Engineering & Physics Club Presents: "CAREER OPPORTUNITIES IN THE PHYSICAL SCIENCES"**

**Monday, October 17, 5:30 – 6:30 PM**

**Room 1604, Oakton Campus**

Guest speakers: **John Carzoli**, Ph.D., Chair, Department of Physical Science, at Oakton Community College, and **Tony A. Asghari**, former Oakton student and Senior Staff Engineer with Motorola Automotive Communications & Electronic Systems Group.

**Sign up soon, as seating is limited. See our flyer, or contact Peggy Swedroe, Division 2 ([pswedroe@oakton.edu](mailto:pswedroe@oakton.edu)), 847-635-1688**