

The Quaternion

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The Ultimate Machinery of Life

by Greg McColm & Richard Stark

Among the great accomplishments of the Twentieth Century were the discoveries of the basic mechanisms of life. Before, scientists had searched for a ghostlike essence that made things alive. We see ordinary atoms constructed into complex machines – proteins – able to construct, dismember, manipulate, or move other molecules around. One kind is designed to precisely fit around a nutritious molecule and chop a specific piece of it; just one tool for the small intestine's toolbox. Another changes shape when hit by a photon. A third, zipperlike, opens up DNA. All living organisms are made of vast arrays of these little machines.

But we do not reduce to mere assemblies of these machines. It is out of their interactions that life arises. These assemblies are vast: there are vastly more such machines in a fly than there are stars in the local supercluster of galaxies. The identification, classification, and study of these machines, and their communities, are the business of bioinformatics, a field that ranges from data mining (to identify bio molecules) to topology (to model the structure of biomolecules) to thermodynamics (to model their interactions).

see Bioinformatics, page 2

In Memoriam: Jack Britton

Jack Britton was born in 1908, and was salutatorian at Worcestor High. He got an A.B. from Clark University and a Ph.D. in 1936 from the University of Colorado at Boulder, which promptly hired him as an Assistant Professor. During World War II, he spent a year working in R & D for the U.S. Rubber Company, and then nine months as an instructor at the U.S. Air Force Pre Meteorology program. He returned to Colorado in 1943, where he ultimately became the Chair of the Department of

see Britton, page 2

In Memoriam: Al Goodman

Professor Al Goodman passed away on July 30, 2004 in his home in Tampa. He was an outstanding mathematician and educator, and a member of this department since 1964.

Al Goodman was born on July 20, 1915 in San Antonio, Texas. He obtained a B.S. in Chemical Engineering and an M.A. in Mathematics from the University of Cincinnati. During World War II, he worked at the United States Navy Yard, the Army Specialized Training Program, and for Republic Aviation Corporation. After the war, he received his Ph.D. degree in Mathematics from Columbia University.

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The Quaternion is an annual publication of the USF Department of Mathematics, which can be visited on the web at <http://www.math.usf.edu/>. Our e-mail address is mathdept@math.usf.edu, our snail-mail address is Department of Mathematics, University of South Florida, 4202 E. Fowler Ave., PHY114, Tampa, FL 33620. Our phone number is (813) 974-3343, and our fax number is (813) 974-7000.

Bioinformatics

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Al Goodman then spent two years at Rutgers
University as an instructor and then fifteen years



The mathematics education faculty welcomed a new faculty member, Dr. Gerretson, as an Assistant Professor of Mathematics Education. Dr. Gerretson received her Ph.D. from the University of Florida and is joining USF from the University of Northern Colorado where she had a position in the mathematics department.

The Mathematics Education program is launching a new Master of Arts in Teaching Middle Grades Mathematics (59)hn Tmr(m2)4 (ee.-c 0 Tw 6.265 073.08-)Tj 0. 06 TEMC /P <</MCID 4 >>BDC 8..42-0-538.8425m0. 06 T

With Application To DNA Strand Design).

And eighteen masters: Aaron A. Anderson, Gokarna Raj Aryal, Sayanti Banerjee, Nathan Nguyen Chau, Elliot Martin Findley, Armando Hoare, Meshwar Kaladar, Jayasheela Karnala, O'Neil Lynch, Mario Vantroy Marshall, Branko Miladinovic, Inna Petrova Nikolova, Nishant D. Patel, Dmitri Prokhorov, Chad J. Smudde, Elenica Stojanovski, Christopher R. Trent, and Elena Vasileva Valkanova.

And thirty-two bachelors: in Fall, 2003, Lisa Borzewski (cum laude), Nathan Chau (cum laude), Christina Hamlet, Lisa Hughes, Min Jeong, Alexis Johndrow, Erika Johnson (summa cum laude), Borja Plesco, Andrew Purcell, Marion Riggs, Jaime Robinson Gray (magna cum laude), Melanie Schlagen in Spring, 2004: Alvaro Blanco, Marie Bosley, Richard Becker, Cheryl Fernandes, June Pak, Wilson Perez, Jesus PierreLouis, Harold Polhill, Paula Ralph (cum laude), James Reynolds (magna cum laude), Xay Savong, Leisha Spinosard and in Summer, 2004: Hashir Ahmed (cum laude), Judi Michelle Charles, C. Frasier, Alex Jorge Guevara (cum laude), Simm Halsell, Tanya Anne Jones, E'Leon Rashad Daryl Lenier Williams

from all over campus to better serve the university community.

One of our new statisticians,

Bayesian inferer Assistant Profes Policy and Geog campus. Reently statistical analys resides in StPet chess with his 1-

The 2004 Summer Program in Mathematics and Science for Gifted and High Achieving Students ran from June 4 through July 9 with 31 students, who studied mathematics (taught by and K), as well as environmental science, computer programming, and conflict resolution. The program was funded primarily by student fees of \$600 per student, with additional funding from the Honors College of USF and the College of Arts and Sciences.

This was also the last year the Center was directed by , who has stepped down after ten years. His successor is .



The USF math club consists of the USF Chapter of the Mathematical Association of America (MAA) and the Florida Epsranging

from math education and actuarial sciences to applications of mathematics to cryptography and membrane computing. Pi Mu Epsilon hosted the Fall and Spring Hillsborough County Math Bowls: 23 High Schools attended the Bowls, each sending teams of four students each. Plant High was the overall winner.



The department is in the process of launching an independent Statistics Institute, housing statisticians

Eleven new Pi Mu Epsilon members were inducted last Spring, and Osman Amin and Jaime L. Gray were co-winners of the 2004 Florida Epsilon Chapter Outstanding Scholar Award

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The Quaternion

~~MEMBER~~

In this issue:

The Ultimate Machinery of Life,
by

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We'd Like to Hear from YOU!

The Department of Mathematics would like to hear from alumni, friends, collaborators, members of the community, and fellow explorers of and guides to the world of mathematics.

Contact us at 813-974-2200 or math@usf.edu

ics, University of South

The Continuing Crisis

The budget crisis – which may be a bit chronic to call a crisis – continues to constrict the department's operations. There are many ways in which you can help.

USF in general, and the Mathematics Department in particular, can use all the help it can get. Contact the USF Alumni Association or the Department of Mathematics if you have any stray change.