

PLACE LABEL HERE

Florida Institute of Technology
Department of Chemistry
150 West University Blvd.
Melbourne, FL 32901



*HAVE YOU BEEN OUT OF TOUCH?
HAD A CHANGE OF ADDRESS?
CONTACT US!
WE WOULD LOVE TO HEAR HOW YOU ARE DOING!!*

E-mail us at cbaum@fit.edu

Or write to us at: Panther Chemist, Florida Institute of Technology, Department of Chemistry, 150 West University Blvd., Melbourne, FL 32901.

*Florida Tech Chemistry Alumni are now on FACEBOOK!
Just search for the Facebook group: Florida Tech Chemistry Alumni and Friends*

Message From the Department Head

Greetings:

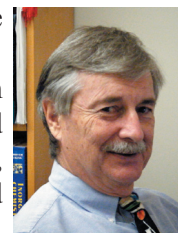
It's always fun to renew old acquaintances when alumni visit and see how everyone has changed, though it makes some of us feel ancient! I'm finding that we are starting to see children of our alumni at Florida Tech. We're proud of our alumni and your accomplishments, and we love to hear about new developments. If you haven't already had a chance to visit our new building, please stop in when you're in Florida.

It's been a great time for the chemistry department with increasing enrollment, research output and our first internal scholarship and award. We awarded our first Dr. J. Clayton Baum Chemistry Award to two outstanding juniors, and are getting ready to make our first Paltzik graduate student fellowship award. Thank you so much for helping to make these awards possible, and a special thank you to John Zung

whose initiative and leadership made the Baum Award possible.

The university has expanded once again with new dormitories, the Harris Science and Engineering Building, a new dining facility, parking garage, the new Autism Center, and an Olympic swimming and diving facility. This all requires funds, of course, and the 50th anniversary capital fund campaign was a huge success, with all goals being exceeded. When you participate in alumni giving, please specify one of the chemistry endowments for your gift (described on p. 3).

It's an exciting time here at Florida Tech, and a time when it is very easy to take great pride in this department, our alumni, and the university. Best wishes, and thanks again.

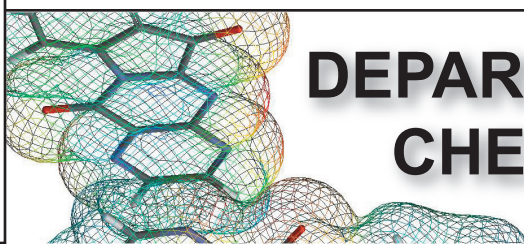


Dr. Babich



**Florida Institute
of Technology**

High Tech with a Human Touch™



DEPARTMENT OF CHEMISTRY



Welcome Dr. Knight

The Department is pleased to welcome Dr. David Andrew “Andy” Knight as a new Associate Professor of chemistry. Dr. Knight comes to us from Loyola University in New Orleans. Previously Dr. Knight was an Assistant Professor at The George Washington University, and before that a Post-doctoral Fellow at the University of Utah. He is originally from England, and earned his bachelor’s and doctoral degrees from the University of St. Andrews, Scotland.



Dr. Knight brings with him an active and vibrant research program. He has been selected by the Office of Naval Research (ONR) as a Faculty Fellow for the 2009 American Society for Engineering Education (ASEE) Summer Faculty Research Program. His research interests lie at the interface of inorganic chemistry and other scientific sub-disciplines including organic synthesis, nanoscale and layered materials, medicinal chemistry, molecular biology, biodefense and green chemistry.

Dr. Knight has been awarded two contracts totaling \$148,278 from the Defense Threat Reduction Agency (DTRA). His project involves designing novel metal-based drugs that will act as broad spectrum therapeutics to defend against biological warfare agents such as Ebola virus and Venezuelan equine encephalitis virus. Working with him are Florida Tech graduate students Christa Simmers and Aaron Funk; postdoctoral associate Ria Yngard; and undergraduate student Laura Congiardo. Collaborating with him is Dr. Eddie Chang of the Naval Research Laboratory in Washington, DC.

Editors: J.C. Baum, cbaum@fit.edu; J.A. Olson, jolson@fit.edu; K. Winkelmann, kwinkel@fit.edu

Baum Award Names First Recipients

At Florida Institute of Technology’s recent Spring Honors Convocation, Jennifer Mumfrey of Midlothian, Texas, and Michael Lucido of Niagara Falls, N.Y., were named the first recipients of the university’s Dr. J. Clayton Baum Chemistry Award. The award recognizes outstanding junior chemistry majors based on academic and research achievements.

Mumfrey is a dual major in chemistry and biochemistry. She is using scanning tunneling microscopy for her research on the synthesis and photochemical characterization of anti-parasitic compounds for the treatment of parasitic diseases. Following graduation she intends to pursue a doctoral degree in synthetic organic chemistry and begin a career in drug synthesis at the research and development levels.

Lucido is pursuing a dual major in psychology and pre-medical chemistry. At the university he has worked as a laboratory assistant and literature researcher in organic syntheses projects. He is also a member of the College of Science Student Advisory Committee as a chemistry department representative. He plans to enter an M.D./Ph.D. program following graduation.

The Dr. J. Clayton Baum Chemistry Award was established by alumni, friends, students and colleagues of Dr. Baum in recognition of his continuing dedication, devotion and service to Florida Tech and the Department of Chemistry. Dr. Baum has been with the university since 1979.

PHOTO: Michael Lucido and Jennifer Mumfrey accept their awards from Dr. Babich, head of the Florida Tech Department of Chemistry.



Editor’s Corner by Clayton Baum

Well, its time (roughly every 3 years!) for another edition of the “annual” chemistry alumni newsletter. As you can see, the newsletter has a new, more professional appearance, thanks to the efforts of Dr. Joel Olson, but our aim is to still keep the personal side. As an added benefit, I am confident that now you actually will receive the newsletter on a yearly basis.

I am very honored to have the alumni establish a student award in my name. I hope that these efforts will serve to foster closer ties among you and with the department as well as recognize and encourage outstanding chemistry juniors. Please keep in touch using the contact info on the outside of this newsletter (including our new Facebook group). Please let us know what is happening in your life, as well as changes in address, and do stop by when you are anywhere close to Melbourne.

Take care, Clayton

New Panther Chemists 2008-2009

Ph.D.

-2008-

Chih-Tsung Chang (Rokach)
Synthesis and Identification of EPA-derived Isoprostanes. Discovery of DHA-derived Neurofurans in Vivo

Pranav Patel (Rokach)
Design and Synthesis of Affinity Chromatography Ligands for the isolation of 5-HEDH Enzyme: Synthesis of Prostanoids and their Identification in Human Urine

M.S.

-2008-

Bello Illiassou (Raissi/Brown)
Solar Hydrogen Production from Aqueous Ammonium Sulfite Solutions

Antoinette Macchia (Olson)
Analysis of Binary Mixed Self-assembled Monolayers via DART Mass Spectrometry

Bhavesh Patel (Sharma)
Reactivity of Aqueous Ferrate (VI) with Imidodiacetate Nitrilotriacetate and Gly-Gly

-2009-

Melissa LeMay (Sohn)
The Effect of Natural Organic Matter (NOM) on Copper Partitioning

Siddieg Elsiddeg (Wehmschulte)
Synthesis of a Titanium Nano-oxo Cluster, Ti(IV) Alkoxide Mediated Transamidation Reactions and Attempts Towards the Preparation of Nitrogen-doped TiO₂

Camille Thorpe (Nelson)
Design and Synthesis of Novel Ferrocene-Containing Block Copolymers

Rachel Gilman (Olson)
Analysis of Tryptanthrin Derivatives via Scanning Tunneling Microscopy

B.S.

-2008-

Mark Goldbach
Ryan King
Kelly Reda
Tycho Spadaro
Margot Zaccardi - cum laude
Antoine Zufferey

-2009-

Lyssa Boyer - magna cum laude
Andrea Chase
Sierra Cullati - summa cum laude
Stephanie Monaco
Michael Rothe - summa cum laude
Sukesh Shekar - cum laude
Stephen Wenzel

We congratulate all our new chemistry alumni on their achievements!

⌘ CHEMISTRY DEPARTMENT NEWS ⌘

The Chemistry Department currently includes 50 undergraduate students, as well as 26 M.S. and Ph.D. graduate students. The department also currently manages over \$1.5 million in external contracts and grants.

The instrumentation laboratory was recently upgraded to include a Perkin-Elmer flame atomic absorption spectrophotometer, a Nicolet FTIR spectrometer, and a Jasco UV-Vis spectrophotometer. These new instruments will be used for teaching as well as research activities.

Monica Baloga recently received a grant from the National Science Foundation (\$182,000 with Winkelmann as co-PI) to introduce interdisciplinary, research inspired, inquiry-based laboratory modules in General Chemistry.

Clayton Baum and his research group continue to be involved in collaborative research with other members of the department, using molecular modeling and molecular spectroscopy as the principal tools. Current projects are with Drs. Brown, Novak, Olson, Sharma and Sohn. Clayton is a coauthor of nine publications in the past year, including two *J. Chem. Ed.* articles on experiments that many of you may recall from pchem lab (charge transfer complexes, laser measurements of the speed of sound). Dr. Baum was promoted to Professor last spring.

Al Brown's research group continues to

collaborate with the Baum Group on sensors for hydrazine; new targets include a diarylamine fluorophore, and acridine and substituted pyridine quenchers. The old collaboration with biologist Jon Shenker, on NMR of fish, has been revived, and 17 little fish are in residence in the NMR lab. A new collaboration with Egyptian heterocyclic chemist Ashraf Aly, our end of which mostly involves NMR, has yielded five papers to date including two major reviews.

Andy Knight is currently spending three months at the Université de Nantes, France as a Centre National de la Recherche Scientifique (CNRS) Research Fellow, collaborating with Dr. Bruno Bujoli on the synthesis of phosphonic acid functionalized Pt nanoparticles for proton exchange membrane fuel cells (PEMFCs) and catalysts for the partial oxidation of alkanes. Graduate student Christa Simmers of the Knight Group recently developed a new cobalt based broad spectrum antibacterial agent which significantly improves the potency of other antibiotics. She presented her research at the National Center for Biodefense and Infectious Diseases at George Mason University, Virginia.

Gordon Nelson, College of Science Dean, and research scientist Feng Yang have successfully undertaken an investigation of the flammability and physical properties of silica and alumina based polymeric nanocomposites (PNCs). In general PNCs

exhibit higher thermal stability than unfilled polymers and the degradation mechanisms are different for metal oxide and nonmetal oxide nanocomposites. Cone Calorimetry results for PNCs showed significant reduction in peak rates of heat release, particularly for alumina based PNCs. The resulting PNCs needed less classical flame retardant to meet flammability requirements, without sacrificing physical properties usually associated with adding flame retardant additives alone. Dr. Nelson co-edited a book, "Fire and Polymers V – Materials and Concepts for Fire Retardancy" based on a symposium at the New Orleans ACS National Meeting. The 22 chapter book is distributed by Oxford University Press (2009).

In **Nasri Nesnas'** lab, Research Professor Dr. Kafui Kpegba isolated and fully characterized a flavonoid from an African plant. Also, new projects using the DART-MS include the characterization of biodiesel fuel by Ph.D. student Peter Cohen and Stephanie Monaco (they won an award for their poster at Florida Tech's annual Research and Design Showcase), and the exploration of novel ionization mechanisms by Ph.D. student Rui (Grace) Guo. A collaboration with Janelia Farm at Howard Hughes Medical Institute and Columbia University (Neuroscience) resulted in Ph.D. student Yannick Ouedraogo and Dr. Nesnas' recent

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Alumni Focus - Antoinette Macchia

Antoinette ('Toni') graduated from Florida Tech in spring of 2008 with a Master's degree in chemistry. She did her thesis work on mass spectrometry of self-assembled monolayers under the supervision of Dr. Olson. After graduating, Toni secured a position as a Forensic Scientist (I) with the Alabama Department of Forensic Science. Her job duties include training law enforcement personnel in the proper use of breath testing instruments. She also calibrates, repairs, and installs the instruments. Toni says that her experiences at Florida Tech helped to prepare her for her job by teaching her how to follow through on tasks until they are complete; her time at Florida Tech also taught her how to ask the correct questions to solve scientific problems. She says that what she misses the most about Florida Tech are the people. The Florida Tech Department of Chemistry wishes Toni well in her future endeavors, and we are happy that she has found a job that she enjoys where she is able to employ the skills she learned while here.

Department News

(continued from previous page)

development of an improved method to synthesize an essential neurotransmitter tool. Dr. Nesnas was promoted to Associate Professor in spring of 2008.

Mark Novak was promoted to Associate Professor in spring of 2008.

Joel Olson's research group is continuing their collaborative research (with Drs. Baum and Novak) involving scanning tunnelling microscopy of pharmaceutical candidates. Dr. Olson has recently received funding from the National Science Foundation (with Drs. Brenner and Winkelmann) to develop a nanotechnology minor at Florida Tech. Dr. Olson was promoted to Associate Professor last spring.

Joshua Rokach was awarded a two-year continuation research grant of \$850,000 from the National Institutes of Health (NIH). The grant, from the National Heart Lung Blood Institute, will allow Dr. Rokach to continue his studies on chronic inflammatory diseases and, especially on the design and synthesis of antagonists to the 5-oxo-ETE receptor. Such antagonists may find a use as anti-inflammatory and anti-allergic drugs. In December 2008, Pranav Patel, Ph.D. graduate student of Dr. Rokach, received from the Orlando Section of the American Chemical Society the Outstanding Graduate Student Award for 2008.

Virender Sharma continues working on the development of an innovative and cost-effective method for using ferrate(VI) for the remediation of contaminants. His

Graduate Student Studies in Japan

The Japan Society for the Promotion of Science (JSPS) accepted **Erik Casbeer** to the East Asia and Pacific Summer Institutes (EAPSI) 2009 Program in Japan. Casbeer is pursuing his doctoral degree in chemistry, with a concentration in analytical chemistry. His research on ferrate chemistry is under the supervision of **Virender Sharma**. Casbeer spent 10 weeks (summer 2009) at Konan University in Kobe, Japan. He conducted his research in collaboration with Professor Satoshi Fujii. The goals of EAPSI are to introduce U.S. graduate students to East Asia and Pacific science and engineering in the context of a research setting, and to help students initiate scientific relationships that will better enable future collaboration with foreign counterparts. Selected students participate in research experiences at host laboratories in Australia, China, Japan, Korea, New Zealand, Singapore, or Taiwan.



recent work includes the kinetics of oxidative transformations of pharmaceuticals by ferrate(VI), which has demonstrated advantages over other oxidants such as chlorine and chlorine dioxide. Dr. Sharma edited a book, *Ferrates: Synthesis, Properties, and Applications in Water and Wastewater Treatment*, with 30 chapters (Oxford University Press, 2008). Dr. Sharma was awarded the 2008 Faculty Excellence in Research Award. Recently Elsevier Publications awarded Dr. Sharma an honorarium on his article, *Silver Nanoparticles: Green Synthesis and their Antimicrobial Activities*.

Mary Sohn has been busy this year publishing articles on arsenic geochemistry and natural organic matter (NOM) oxidation. Collaboration with Drs. Sharma and Baum has led to new projects utilizing synchronous scan fluorescence and Fe(VI) as tools for characterizing NOM fractions.

Rudi Wehmschulte's group continues their work on two main areas: the NSF funded (\$400,000) investigation of very strong Lewis acids with a focus of activating small molecules such as hydrogen, carbon monoxide and olefins, and the development of mild synthetic methods for the synthesis of oxide and nitride semiconductors.

Kurt Winkelmann is currently participating in several funded projects, including development of virtual chemistry lab experiments in Second Life, creation of a nanotechnology minor program at Florida Tech, redesigning the general chemistry lab curriculum to create more research-based experiments, and development

of new nanotechnology experiments for freshmen students. Project collaborators include Joel Olson and Monica Baloga in our department, Jim Brenner in Chemical Engineering and Amanda Burns in IT. Dr. Winkelmann was promoted to Associate Professor last spring and received Florida Tech's Andrew W. Revay Jr. Award for Excellence in Service.

Interested in giving to the Chemistry Department?

There are several endowment funds available that directly support the chemistry department:

The Paltzik Endowment - Endowed by the family of Alan Paltzik and alumni. Provides fellowships for outstanding incoming graduate students.

The Baum Endowment - Endowed by alumni. Provides scholarship award(s) for the outstanding junior undergraduate student(s).

Chemistry Endowment (Blatt Seminars) - Endowed by Organic Syntheses and alumni. Provides funds to host a speaker who is a world-famous figure in organic chemistry research.

Sharma Endowment - Endowed by New York Community Trust Funds. Provides support for research in environmental remediation and iron chemistry.

For more information contact Dr. Mike Babich at babich@fit.edu