

# CHE Graduate Newsletter

North Carolina State University

Vol 3  
Num 1

## Who's got Next

Joshua Michel  
Editor

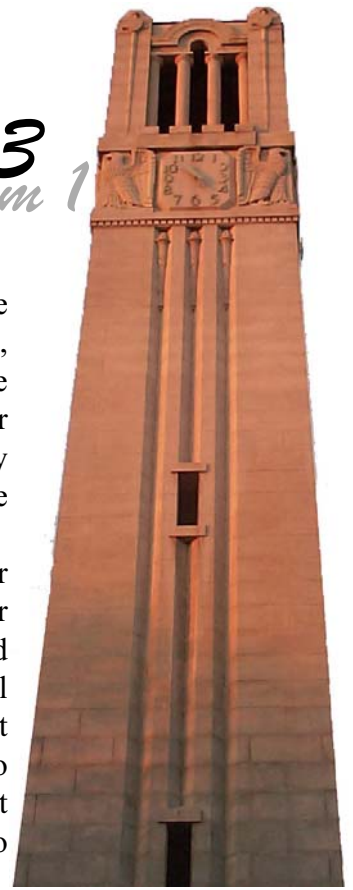
When the idea for this Newsletter was discussed three years ago over a pint of Guinness at Hibernian we had little idea of what lay ahead. I should actually say several pints of Guinness because anyone that knows Chris Kloxin and I are fully aware that we can't have just one. Chris did some of the hardest work in acquiring the editing software and setting up the first newsletter.

After three years of involvement as a writer, co-editor, and editor my reign of terror is coming to a close. With each year the Newsletter has become more sophisticated and a part of our department's core.

This purpose of this publication was

to give the graduate students a place to voice stories about their adventures, experiences, and advice for all to hear. I think we've achieved that, but can go so much further in the future. I look forward to regularly contributing articles until I graduate, or the universe ends, whichever comes first.

To keep the CHE Graduate Newsletter tradition alive and flourishing we need your help. A couple upstanding individuals need to step forward and take on the editorial responsibilities. I'm throwing the gauntlet down to the first, second and third years- who wants to rise to the occasion? Please contact myself or Mike Weiger; we look forward to hearing from you...



## Heartbreak for CHE Football Franchise

Ian Schneider  
Sports Reporter

Another year and another disappointing end to a season with high hopes of attaining the seemingly unattainable goal of intramural t-shirts in competitive flag football. The core of the squad was back

from last year and they looked poised for the challenge of the Grad/faculty/staff league. Team Che left round robin play with a 1-1 record including two rainouts and a heartbreaking loss to the Vet School, eventual league champions. The first win was an impressive 24-20 victory over BAE athletics who fielded several players over 6' 6", however the persistent defense of Team Che along with a west coast offense held them off. The 14-12 loss to the Vet School was attributed to poor clock management (primarily by the officials) in the second half. With a two-point lead the Vet School was able to milk most of the second half clock.

In the first round of the playoffs, Team Che, was slated for a rematch with BAE athletics. BAE led most of game, exploiting their height advantage. However, with time running out in the second half Team Che with Clint Miller at quarterback marched down the field. Miller ran the ball in and scored to tie the game at 14 with mere seconds remaining. A botched extra point attempt forced the game into overtime. BAE scored rather quickly, but good pass coverage by the secondary (Shaun Tanner, Mike Weiger, Ian Schneider and Josh Michel) prevented

scoring on the extra point attempt, leaving the score 20-14. The offense executed their short-gain strategy well and scored on a run by Miller, tying the game at 20. The game winning point was caught by second-year Michael Weiger, moving Team Che one step closer to the coveted intramural t-shirt.

The championship game matched the Vet School with Team Che. The first score was a 60-yard catch by wideout Josh Michel, however the offense failed to sustain momentum and fell behind by two touchdowns. In the second half, Team Che charged back, catalyzed by

"it felt so damn good to tackle that punk."  
-A. Marchut

interceptions from Ian Schneider and Shaun Tanner. Also of note was the gutsy play by Don Comfort who incurred a broken finger in the middle of the first half, but remained on the field making several key tackles. The finger would require surgery the following week, but a

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Editor - Joshua Michel

## JVZ says Polymers are Cool

An Interview with John Hollis Van Zantan Jr.

**Paul Chin**  
Staff Reporter

**J**ohn Hollis van Zantan, Jr. was born on February 26, 1964 in Lynwood, CA. An Assistant Professor in the chemical engineering department, he received both his undergraduate and graduate degrees from the University of California, Los Angeles (UCLA) in 1986 and 1992, respectively. As an undergrad, and during the year following his undergraduate studies, he was employed as an ironworker.

After graduate school, John joined NIST near Washington, D.C., as a NRC Postdoctoral Fellow for two years. He then joined the staff of the Electronic Packaging Group of the NIST Polymers Division for one year before accepting an Assistant Professorship at John Hopkins University in Baltimore, Maryland.

John married his wife Heidi in 1995. John and Heidi are the proud parents of three boys: Eli Maurice, Abraham George, and Zev Winston. One of his advisees, Chris Kloxin, says he listens to “crappy old country music,” while another, Shaun Tanner, says, “ever since kid #3, he’s been edgy. Now, I only go into his office alone if I have good news.” I had the fantastic opportunity to interview John and inquire about his rich past, present, and future.

### *For starters, give me a brief history of your life (up to high school)*

I was born in the suburbs of Los Angeles, CA at Saint Francis Hospital. My parents are John and Suzanne. They were both Southern California (SoCal) natives, which was a rarity when I was growing up. I was reared in Orange County, which is south of Los Angeles.

I had a typical childhood, going to school, playing all the sports. In high school I primarily played football, had a part-time job, and was involved in Orange Countywide math competitions. I played football in one of Orange County’s powerhouse programs. I was very successful as a high school player, but was too small to play major college football.

### *How did sports influence your childhood, especially your football career?*

I started playing tackle football by the time I was 8 years old. Coming from a neighborhood with a football powerhouse, football was very popular. We had a very successful program for 8-14 year olds. Sports were a very big thing for me. I think it was a great thing because I went to a “gifted” elementary school program, so a couple of guys I went to elementary school played sports with me, but primarily the rest of the guys were from the general student population, so I had lots of friends outside of my academic circle.

I played center and linebacker in high school. As a young kid I played more of the ‘skilled’ positions on offense, but I was more interested in playing defense when I got into high school. Football is all about

blocking and tackling, it isn’t a fancy game, contrary to certain opinion. [laughs]

### *What made you decide to be a chemical engineer?*

Neither of my parents went to college; I had an aunt who had gone that I didn’t know well. That was the extent of college in my family. I was interested in chemistry, physics, and mathematics. In reality I started off in electrical engineering (EE) at UCLA because at UCLA the EE program was impacted. You either needed to come in as a freshman as an EE or you would have to wait until your Junior year, and it was a competitive process to get in.

Going in I was originally leaning towards ChemE, I just needed to enter as an EE in case I wanted to do that. But I confidently made the switch to ChemE and have never looked back. ChemE was by far the best choice for me. I enjoyed the curriculum and UCLA had an excellent program. There were a lot of new faculty members when I was there.

### *What motivated you to go to graduate school, and why did you decide to attend UCLA for both undergraduate and graduate school?*

There was a fellow named Yoram Cohen, he was a young professor at UCLA at the time and he, accurately or not, identified me as someone having talent. He talked to me about it, and would encourage me. Over time, I decided that it

was something I wanted to do.

Primarily, staying at UCLA was because of a family situation. I took a year off after my undergrad studies to work as an ironworker because my grandmother was ill. I was very reticent about leaving SoCal; I didn’t think my grandmother was going to live much longer.

At that time I didn’t want to go to Cal Tech because there wasn’t anyone I wanted to work with and as for USC-well I went to UCLA. UC Santa Barbara (UCSB) was still primarily known as UC Surfboard back then so I went back to UCLA. UCLA, like many universities, has a policy of not taking their own undergraduates, but I explained to the Chairman that if I didn’t go to graduate school there I was probably never going to go, so he made an exception for me.

It worked out well as I worked with Hal Monbouquette, who was brand new when I started off as a graduate student. My knowledge of UCLA was a benefit for him and me, and I had a new person that I didn’t really know about, so I got a “newness” of an experience that way. Hal was actually a PhD student of David Ollis, so Dave Ollis is my academic grandfather.

My motivation for going to graduate school is probably because I thought the jobs for BS ChemE were looking pretty good, but working as an ironworker I was making more money than a BS ChemE!! [laughs] I thought maybe if I got a PhD I could find something that I preferred

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to do. I like the challenge of doing new things. In retrospect, I see it as the last time for students to really focus on something difficult without too many distractions. Whether you go on to do research or not, it should give you the confidence and ability to be productive and sound in everything you do.

***Did you convert to Judaism?***

I didn't convert to Judaism. I come from a family that's Christian in origin but not really religious, so that wasn't an issue. While I believe in a higher power of God, I may not be in complete sway with all the teachings of Judaism. To me, unless you're going whole hog into something, you shouldn't just do it, especially religion.

I think Judaism is a great religion, I go to temple with my family whenever possible, and I actively participate. I think a lot of benefit comes from participating in religion. I was lucky enough to have a father that was borderline agnostic, but he lives as close to a pure life that anyone could live-almost religious in his own way. He's got a code that he lives by most of us wouldn't be able to touch. I've never felt unwelcome at the temple. I participate a lot with my family doing charity things for the temple, working around the temple, and I feel part of the temple. Chances are I'll be learning a bunch of Hebrew when Eli starts preparing for his Bar Mitzvah. As the kids move along, I will know more and more about it.

My wife is Jewish. My wife was adopted by a Jewish family, but she knows her birthparents. By Texas law at the time, they tried to place Jewish children through adoption agencies with Jewish families, so that's how she was placed. She was born to a Jewish mother, which makes her a Jew. She was raised as a Jew by a Jewish family, and is very involved with her religion and has a traditional sense.

***Tell us about some of your recent work and how you got started in it.***

I've always worked in the areas of polymers, colloids, and surfactants in solution, and I've always had an interest in the applications of those things in the nontraditional areas: biotechnology, material synthesis, or some cutting edge measurement techniques in basic, fundamental aspects of those systems.

The first major area I work in these days is looking at the microscopic dynamics of complex fluids, particularly using the diffusion of a Brownian sphere in the media. We are looking at diffusion properties or the way that sphere moves around, and trying to interpret the underlying dynamics of the suspending media. Some people call this tracer microrheology. I see it as a fundamental problem that's fun to work on; it's a good physics problem for a chemical engineer student to study because it's about diffusion and Brownian motion, things that students know well.

The other major area I have going on is nonviral gene delivery vectors, which builds on my background working with liposomes, and generally polymers and surfactants in solution. The DNA or nonviral vector work started at John Hopkins University (JHU). We had an overflow of PhD students one year, and I was assigned one of these PhD students, Eva Lai. I could have easily put Eva on a Brownian motion project, but she really wanted to do bio. I looked in the literature and came up with this idea of her working on nonviral gene delivery vectors.

That's what I primarily do. I also do some work in high pressure scattering- x-ray scattering, light scattering, neutron scattering-with a recent seminar speaker Mark McHugh, who I worked with at JHU, and

is currently at Virginia Commonwealth University.

***What areas are you hoping to expand your research into in the future?***

I'll keep working on what I'm working on right now, but expand on them. For instance, the work on DNA, involves essentially looking at how a negatively charged molecule interacts with positively charged polymers and surfactants. The complexes you form are similar to polymers called polyampholytes that bear both positive and negative charges. So, for instance, Dr. [Jan] Genzer, Professor Michael Rubinstein at UNC Chapel Hill, and I have begun talking about beginning a long-time collaboration on polyampholytes.

***What personal goals do you have, in all aspects of life?***

First and foremost, my family is the number one priority. I like spending as much time as I can with my wife and children. Work-wise, there are some things you need to do in this job, and as long as you do them and do a good job, you should be pretty happy with yourself.

The key things are: 1) we're in a research university, so research is very important, mentoring graduate students, producing papers, and maintaining an active research program; 2) since [NC State] is **the** engineering school for the state of North Carolina, I think it's important that we do a good job of teaching. I think that's one of the nice things about our department is that we've got to be one of the best teaching departments while maintaining a high level research environment; 3) doing service to the department is very important.

The goal for myself is to be able to look at myself in the mirror every morning and be happy with what I've done and where I'm at, and be at peace with myself. You want to shoot for some sort of balance, and different things work for different people.

***Your children's names are Eli, Abraham (Avi), and Zev. What were the reasons for naming them?***

I have 3 boys- Eli is 4, Avi is 2, and Zev is 0+. Eli is named after two grandfathers, Eli Raffkind, his mother's paternal grandfather, and Maurice Eli Gimp, his mother's maternal grandfather. Maurice Gimp's nickname was Moe, and Heidi's grandmother Dorothy is still alive and she calls Eli "little Moe." [laughs]

Abraham George was named after Heidi's great grandfather Abraham Viner and after my great grandfather George Rathbun. That name is also shared by a recently deceased family member, Abe Brand, who was an outstanding individual in Heidi's family. Also, I have a great uncle named George Loffswold, who happens to be a son-in-law of George Rathbun, and is an outstanding fellow as well.

Those are family names, it's kind of a Jewish tradition. If you have some family member you'd like your child to emulate or you hold in high esteem, you name them after that person. Unfortunately, traditionally that person should be deceased at the time, there's a thing about stealing their souls or some of their thunder while they're still on Earth.

After Zev was conceived and we were thinking about names for him, we ran out of family names of people that were deceased. We've always liked the name Zev-we met a young man of that name in Israel who we liked a lot. Over time, we found out that Zev meant "wolf" in Hebrew. That was kind of a neat name to have. Plus, Zev van Zanten has a nice ring to it, and his initials are ZvZ, which makes you a pretty

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## Improve your well-being: Volunteer

April Morris Kloxin  
Community Reporter

I often feel like I work most of the time—days, nights, weekends, and holidays—yet I never feel like I have accomplished a lot. In the world of graduate school and research time flies by, while forward progress and results come very slowly. It can get frustrating thinking every day “What did I do today?” and as the days string together “What is it that I am doing? Does what I do everyday make any difference?” I have found a temporary cure to my own slow-progress blues: volunteering.

I started volunteering last school year at Fred Olds Elementary School on Dixie Trail. I would go every Monday from 3 to 5 pm and help third and fourth grade children with their homework. It only took 2 visits for the kids to start recognizing me. When I would arrive during their after-school snack break, several of them would come running up to hug me and say hello. It is amazing how much love and energy kids have to give.

Fred Olds Elementary has an after-school program where the students have 3, 1-hour periods of homework, physical activity, art, or music from 3 to 6 pm. Students who are having difficulty in their classes have to work on their homework, regardless of if the period is up, until the work is finished. The students stuck in the cafeteria are the same ones each week with little hope of getting out. These at-risk students have a combination of things working against them: behavioral problems, parents too busy or disinterested to help, or learning disabilities. They generally try hard at their work, but do not have the focus or support to finish it or do well. This is where tutors come in, as many tutors as possible.

You may ask, what can a tutor do in just a few hours a week? First, the kids need encouragement and support: someone who is interested in what they are doing and who can offer kind words of praise for the students' efforts. Second, they usually need help with fractions, division, word problems, and sentence writing. This makes the tutor feel smart—which most graduate courses work against—and at the same time clarifies things the student may have missed in class. Last, the students need a role model that shows the value of education and that engineers are people too—how are we ever going to show people that engineers are normal unless we get out there in the general population?

So far I have focused on why volunteering is good for the recipients, but I genuinely think that I got more out

of tutoring than the students did. For a small fraction of my time each week, I was able to return to the real world where time moves at normal pace and few hours spent helping someone makes a world of difference. Each week I would go to these kids and get my “happy feelings” injection that would last me until the next week. Each person has to find his/her own way to relieve stress, but why not make a difference in the world at the same time? Many volunteer opportunities are available, from tutoring students of all ages to working in a soup kitchen. For volunteer opportunities near you visit:

[http://www.thecommunityvolunteer.org/volunteer\\_opportunities.htm](http://www.thecommunityvolunteer.org/volunteer_opportunities.htm)

<http://www.wcpss.net/volunteer/index.html>

### *Football from page 1...*

full recovery before next season is expected. Comfort explained, “It was a fake reverse and I was on contain. The quarterback kept the ball and was trying to break my containment. He almost beat me, but I dove and grabbed his flags making the tackle for a loss. Unfortunately, I broke my finger on the landing.” With less than a minute remaining, Team Che scored on a Miller run, but failed to convert the extra point bringing the score to 19-12. The Vet School took over on their own twenty and was nearly sacked in the endzone for a safety. Linebacker Alex Marchut mauled Vet School's quarterback on the play, drawing a roughing the passer flag and ending the game, the season, and any hope of a free t-shirt. Afterward Marchut reflected on his monster hit, “We should have had a safety there. If we had scored when we got the ball back we would have won the game. I must have let my emotions take hold of me. I would have to admit it felt so damn good to tackle that punk. He knows who his daddy is now.” His improved play at linebacker anchored the defense through most of the season, however his aggressive play was penalized frequently. Although a disappointing end, the season marked one of the closest that the department flag football team has been to attaining an intramural t-shirt. With Jim “the fish” Semler as the only departing senior Team Che is a setting a solid foundation for the franchises future.

### Quote Corner

There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

Donald Rumsfeld

Facts do not cease to exist because they are ignored.

Aldous Huxley

## A Taste from the Nile

**Ahmed Eissa**

Internation Correspondant

**I**t was 4:30 PM in Cairo Airport, almost 24 hours after leaving Raleigh we landed in Cairo airport as I was having my annual vacation back home in Egypt. I was really excited to see everybody in my family. At this moment, I thought it would be nice if I can tell you something about my home country. One of the wonders of this country involves the centuries of history within its border. Pharos, Greeks, Romans, Copts, Arabs, and many more people have inhabited Egypt. This contributes to the countries unique mixture of ancient civilization and modern technology found in few other locations.

Any visit to Egypt is incomplete without a visit to a number of key sites. Cairo, the “huge” capital is inhabited by more than 16 million people and contains eight universities. Within Cairo itself, there are many suburbs which exhibit a wide variety of architectural styles. Zamalek, Heliopolis, and Maadi are vast suburbs with modern designs. Ramsis and Tahrir contain the “crowded” governmental districts where locals are often buried in bureaucratic paperwork! On the other hand, Al-Qal’a (the castle), Khan El-Khaliliy, and Al-Azhar are historical landmarks containing wonderful remains of the ancient Islamic civilization. Islam is the main religion in Egypt, followed by Christianity. In Zitoun and Abbasseya, you find Coptic churches such as Virgin Mary Church, and Saint Mark Cathedral. The majority of Christians in Egypt belong to the Coptic Orthodox Faith, however you can still find Roman Catholic, Angelican, Aremnian, and Greek Orthodox.

The pyramids of Giza, built during the 4th Dynasty (2680-2544 BC), represent the oldest and only remaining wonder of the world. So, as you see, it is an interesting mixture of modern life and ancient civilizations.

In addition to Cairo, there are many dazzling places that you need to go. Alexandria, the “pearl” of the Mediterranean is the second biggest city. Located on the Mediterranean Sea, millions of Egyptians spend weeks of the summer on its extended shores. Just as popular are the beaches located on the Red Sea. Hurgada and Sharm El Sheikh are the most famous resorts on the Red Sea in Sinai. The quality of seawater and nature are unsurpassed anywhere in the world. Interestingly, in these resorts, the population of tourists is more than Egyptians!

Moving to the south, we find Aswan and Luxor. These two cities are filled with monuments and remains of

the old pharo kingdoms. Karnak temple, the largest temple complex of the country, is also the largest one in the world. In these places, you are free to use your camera to take wonderful photographs. There is also the Valley of Kings, location of King Tutankhamun’s famous tomb; as well as Valley of Queens, final resting place of Queen Nefertari. In addition to the splendor of its museums and ancient temples, Luxor is also the perfect location to embark on a Nile Cruise.

The Nile, Egypt’s artery, supplies water for agriculture and human needs. More than 4000 miles in length, The Nile stretches from Zaire and Ethiopia to the Mediterranean Sea. The scenery is best taken in while riding on a “Foluka” - the traditional Egyptian sailing boat. But, before you leave remember to take a drink from the Nile. According to the local lore “Whoever drinks from the Nile and leaves, must return to Egypt again!” For me it is true!

### Recent Graduates

Ahmed Abdala	PhD
Brian Attwood	PhD
Lara Chang	PhD
Karen Kennedy	PhD
Brian Novick	PhD
Jorge Pikunic	PhD
Marybeth Pysz	PhD
Srinivas Siripurapu	PhD
Nickolas Smith	PhD
Teri Walker	PhD
Elizabeth Wilder	PhD
Tao Wu	PhD
“Evil” Jeff Yerian	PhD
Jian Zhou	PhD
Yazan Hussain	MS
Zhengmin Li	MS
Ruchi Gupta Singhal	MS

## Alex Marchut's Corner

Because that is all we'll give him

### BEST ROCK SHOW TO COME TO THE TRIANGLE RECENTLY

For those of you who haven't discovered it yet, there's a club in a strip mall out in Carborro (a tiny town out by Chapel Hill) called the Cat's Cradle that brings a ton of great rock bands to the Triangle. They recently hosted Guided By Voices, a legendary great of indie rock. The show started with some half decent opening band whose name I've already forgotten (I think it involved blood lust or something). Guided By Voices came on next and proceeded to play all the songs on their upcoming album (to be released soon on Matador) in the order they appear on the album. It appears as if there's some decent rock & roll on that album. After they plowed through that they played a bunch of their older stuff including my personal favorites "Watch Me Jumpstart" and (this one is key) "My Valuable Hunting Knife." It was well worth my \$14.50.

*Note added in proof:* that album "to be released soon" has been out in record stores since the summer of 2002. It's called *Universal Truths and Cycles* and it rocks. However if you're looking to buy your first Guided By Voices album I'd suggest *Alien Lanes*.

### THE REAL BEST ROCK SHOW TO COME TO THE TRIANGLE RECENTLY

Ok so I wrote the thing above for the original Alex's Corner and it got canned (who edits this crap?) but I couldn't resist using it. However, there was a better rock show in the Triangle- Sonic Youth played Raleigh! They came to the Ritz in August 2002 and played with some opening band that was apparently pretty forgettable because I've forgotten who they were. But Sonic Youth (who might consider changing their name to The Sonic Elderly since they've been around for so long) rocked! They played every song off their new album, *Murray Street* (which kicks some mighty arse by the by- it's seriously their best album in quite some time) and mixed it up with some of my old favorites- Cotton Crown (off their album *Sister*, an oldie but a GOODIE), Bull in the Heather (from *Experimental, Jet Set, Trash, and No Star* which was one of those recent albums that was surpassed in quality by *Murray Street* to put it politely), Drunken Butterfly (from *Dirty*- Alex's first Sonic Youth album, awww), and Eric's Trip and Kissability (which are on the classic you-must-go-out-and-

buy-it-now-if-you-don't-already-own-it-or-at-least-ask-Alex-to-burn-you-a-copy *Daydream Nation*). Somehow I was unfulfilled, though. Perhaps it was because the Youth didn't play long enough (dammit!). Might have been worth my \$21 if they played a second encore. Ah, fark it, what the heck am I saying, it was well worth it- it was Sonic Youth!

Honorable mention goes to some other good show's I've seen at Cat's Cradle: Luna, Spoon and Crooked Fingers, Yo La Tengo, Mogwai, and Nada Surf all played there in 2003.

I was recently put on assignment by the powers that be...I was commanded to seek out a local record store and produce top five best and worst lists of what I found in the CD for a dollar section. Here's what I found.

### TOP FIVE BEST ALBUMS I FOUND IN THE RECORD EXCHANGE'S DOLLAR BIN

No actually good albums were found.

### TOP FIVE WORST ALBUMS I FOUND IN THE RECORD EXCHANGE'S DOLLAR BIN

5. *Back in the USSA*- The Interpreters. I'm ashamed to say I actually owned this album at one point. In my defense, a friend who worked for a record label gave me a promotional copy. It sucked. What's more, these dudes are ego maniacs.

4. *Out of Nowhere*- Gloria Estefan. Sorry to all you Gloria Estefan fans.

3. *Loaded*- Ricky Martin. Ricky Martin is \*NOT\* cool.

2. *Landslide*- The Dixie Chicks. Please note this album did not make this list because of any of this band's political statements. This band just makes sucky music. End of story.

1. *Candlelight Magic, 50 Romantic Favorites*- a compilation put together by Reader's Digest. This selection needs no justification or explanation. I know it sucks without even having so much as looked to see what songs were on it.

*JVZ from page 3...*

unique individual [laughs]. His middle name is Winston, after Winston Churchill, who one could argue saved Western civilization 60 some odd years ago. He is a man that my wife and I hold in high regard.

***How difficult is it for you to juggle your research, teaching, and family?***

It's not a simple thing. First and foremost, I'm lucky that I have a very good spouse. My wife has been supportive in everything that I've done. I've known her since 1993 when I was a post-doc, so she knew what the life was like when she met me. It takes a lot of time to be a good scientist and a good researcher; it's definitely not a 40-hour week.

It's difficult, but you can make it work. I'm very fortunate that I don't require much sleep [laughs], in fact I never have. Like anything else, there are some things that you want to do, whether it's your family that your balancing, or your graduate studies, or you like to exercise, or you have some hobbies; you should make time for those things, it makes you more efficient.

One can only work on a real difficult task for a certain amount of time. Even if you work 60 hours a week, I doubt anybody's productive brain is going full throttle for 60 hours. Like anything else, work fluctuates up and down, and the balance is very important. If you can balance it right, nonwork activities can rejuvenate you and help you out in the professional aspects of your life.

***What personal hobbies do you have outside of research?***

My biggest hobby is that I keep tropical fish. I don't have as many aquariums going as I'd like right now. I'm in the process of getting all the tanks that I brought from Maryland up and running. Hopefully within the next 6 months or so, I'll be back to where I was at when I was in Maryland. Growing up as a kid, unfortunately my parents and two brothers had asthma; therefore we did not have any cats or dogs. We had some pet rats that lived in the garage [laughs]. So I got into fish when I was 12 years old.

I like to read a lot, but I don't get to read as much as I'd like. In terms of my free reading time, I focus on keeping up with various periodicals that keep me up on pop culture, and what's going on around the world. I think that it's important because it allows you to relate to other people. You need to know what's going on in general, and not keep yourself cut off. I enjoy listening to music, and going to listen to live music when we get the chance. Heidi and I used to do that a lot before Eli was born. We don't do it as much, but we still do that a few times a year.

***What direction do you see the future of chemical engineering heading towards?***

I think chemical engineering is coming back to where it was 20 years ago. I was kind of the first vanguard of a group of students focusing on a process-based curriculum. You took a year of design, unit operations labs, process control classes, and that was mixed in with the engineering science courses that had built up, which was great because there was a focus on increasing capacity as chemical companies were growing in size.

Nowadays it looks like product development is just as important a

job as process development. When you start dealing with product development, you need to know a lot more chemistry than the current ChemE students know. It's a fact that as various courses were added to the ChemE curriculum, invariably what was squeezed out was chemistry classes. It's a good trend here at NC State that we have a lot of students double-major in chemistry and chemical engineering as undergraduates. I see it getting back to that.

The core areas of ChemE are always going to be strong: petroleum, pharmaceuticals, cosmetics and food products, personal care products and more and more materials processing, as well as biotechnology. If science is to make inroads into public policy, especially in terms of environment, health, and things like that, ChemEs will play a big role in that process.

Like any business, chemical engineering will keep morphing and changing, but those core industries will be around. The more flexible you are, the better off you are going to be in the future. I think there's something for everybody in chemical engineering.

***What is the one piece of advice you would give to graduate students?***

One piece of advice I'd give to graduate students would be to always be open-minded, to realize that you will invariably work on projects with other people, so learn to take criticism in the right way. It's got a bad connotation usually, but productive critics are trying to help you with what you're doing. More than anything, learn to be critical of other people. If you're working on a project together, and something's not going right or you think someone can do something better, you should tell them.

You have to learn how to do it in a way that it doesn't adversely affect that person, say if it happens to be your tennis partner, or the person you do xyz with all the time, or a good friend of yours that you can get along with [laughs]. It helps you out with everything in life, you just can't be too touchy.

***Last question. Your advisee, Chris Kloxin, says you listen to "crappy old country music." Comments?***

[laughs]. I like listening to all kinds of American music: country, western, blues, R&B, mountain, jazz, etc. I have developed more of a predilection towards traditional country and western music as I got older. I just like to torture him with country music when he's around. He's lucky on those long drives to NIST in D.C. that I don't drive him crazy with it.

**Note Added in Proof by JvZ:** Hmmm, on second thoughts maybe I should get a hold of one of those Spinal Tap amplifiers, you know, the one that goes to 11, and put some Hank, Webb, Lefty, The Man in Black, Hag, Ray, Carl, Jones, Faron, Willie, Waylon, Loretta, etc. on continuous loop in the lab to, er, motivate Chris to complete his work in a timely manner. Although I do not profess to speak for her, I believe April could be a potential supporter of such a venture!

**Recycle Me !!!!!!!!!!!!!!!**

**The Gods will smile on you**