



*"Developing Outstanding Ideas and Individuals... One at a time."*

# ARG Alumni Newsletter Summer '10

## 1. Greetings

Greetings to all ARG members past and present. This Summer newsletter is a bit late but better late than never. As reported in the last newsletter, our server has transitioned and the new server can be found <http://mr-roboto.mechse.illinois.edu>. This should have most of the lab updates in the What's New section. We've been busy, and as you'll see later, we've been out of the office a lot. However, it's all good stuff. We've been productive (as usual) but also have attended to personal developments; 2 weddings in the lab. The new semester has kicked off and is in full swing. We hope you'll have a chance to drop us a line or even come by Chamba if you're nearby.

## 2. Who's New?

Surprisingly, there are no new graduate students or post-docs to add to the ARG family this go around. I think this is the first time writing this newsletter when there hasn't been someone new to introduce. We do have a new student, Amanda Stowers, who is working on some of the vehicle related activities. She's resurrected the Illinois Roadway Simulator and is working on supporting some of our automated guidance work. However, she's still an undergraduate and only a sophomore. She's working with us

as part of an undergraduate research scholars program.

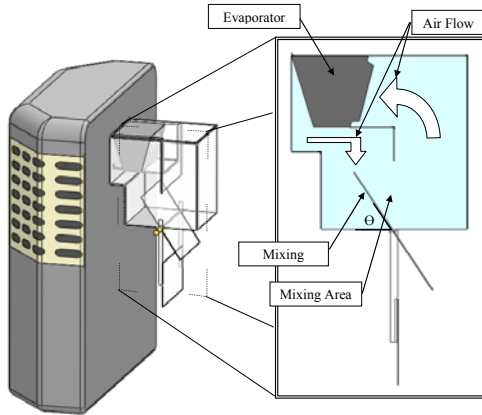
We're still a healthy group size with several projects running. Additionally, there won't be many people leaving this year so we'll continue to be quite healthy. However, we will be looking to add more folks for the Spring semester and next Fall. If any of you out there know of excellent "ARG-worthy" people interested in attending graduate school next year, feel free to point them our way.

## 3. Transitions

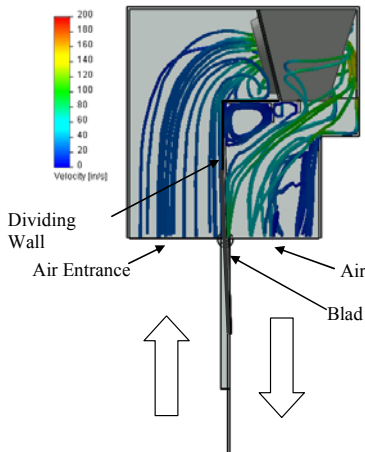
Dr. Sandipan Mishra finished his post doc with us in the ARG and moved on to take up an assistant professor position at Rensselaer Polytechnic Institute in the Mechanical Aerospace and Nuclear Engineering department. You can visit him at [mane.rpi.edu](http://mane.rpi.edu) once he's got his departmental website set up. Sandi did a great job with the e-jet team within NanoCEMMS and really helped moved the e-jet process from a research tool to a commercially viable process.

Rich Otten finished his M.S. degree in the ARG working on superheat control for Air Conditioning and Refrigeration systems. Rich was involved in the ACRC here at Illinois and developed some good 2 degree of freedom controllers for superheat regulation in the face of capacity demand changes. Additionally, Rich came up with a novel hardware-in-the-loop emulation system to

allow AC&R benchtop testing without a large test cell.



As shown in the figure here, by redirecting air and mixing it with ambient air, he was able to get a good amount of ‘environmental load’ control on the AC&R cooling unit. This was a neat mechatronic device with some CFD to understand recirculation set up in the system.



After graduation, Rich decided to head west and join Brian Eldredge and Scott Manwaring at Sandia National Laboratories in Albuquerque, NM. He will be working in the nuclear safeguarding area.

In addition to Rich and Sandipan, Kira Barton also solidified her plans for transition from ARG. She will be starting as an Assistant Professor at the University of Michigan in the Fall of 2011. Kira will stay at UIUC as a post doc after her defense (scheduled for Oct. 5<sup>th</sup>). At Michigan, she’ll be in the Mechanical Engineering department

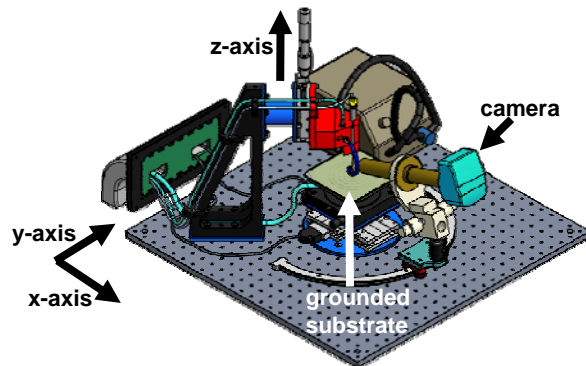
and focus on manufacturing and precision motion control.

## 4. Accomplishments

Keeping with tradition, here is a partial list of some of the activities and accomplishments for current ARG members.

- David Hoelzle successfully passes his Ph.D Prelim Examination
- Neera Jain received a DOE Office of Science Graduate Fellowship.
- Kira Barton is a finalist for the Illinois-Lemmelson prize for entrepreneurial activity
- Vikas Chandan deposited his M.S. thesis
- Rich Otten deposited his M.S. thesis
- Prof. Alleyne was a FIRST Professor at CU-Boulder

Last newsletter, I had indicated that Sandipan Mishra, Kira Barton, and Erick Sutanto had been working on a low cost E-jet system. One of the more exciting activities this past spring/summer was the acquisition of this system by Sharp electronics. Their Materials research division bought out the desktop system that the students were working on. This was exciting because it’s the first industrial installation of one of the E-jet systems. Erick is currently designing and building the next version. Stay tuned, there may be a business model here.



We also have some non-professional, yet very important ARG news to report. Yangmin Xie and Hang Shi were married over the summer in China. We’re very happy

for them both. Here is a picture of the happy couple in China.



Also, Kira Barton and Alex Shorter were married in late Spring 2010. This was also a very happy occasion for the ARG. There will be a party this Fall in Colorado so we'll send pictures from that in our Winter newsletter.

## 5. ARG Summer.

We had a very busy summer within the ARG...although you wouldn't know it by coming by the lab. The lab was a little quiet for the last half of the summer. The main reason for this was that many of the ARG members were conducting their research off-site. Yangmin Xie and Nanjun Liu were both off-site working at John Deere as part of their research.



Here we can see (sort of) Yangmin in a combine. That's her in the cab. Her project is focused on the Header Height control

problem for combines. At Deere this summer, she did a lot of field tests to support her modeling and analysis. She did several feedforward and feedback control designs and got a very good sense for the meaning of zeros providing fundamental limits to the performance of any control system.

In the following figure, you can see Nanjun at the test site for her automated tractor guidance research. She was using a GPS based system to automatically steer a tractor through a field. The work she did this summer was to investigate automated plant model identification under agricultural types of conditions. She was working on the tractor that you can see to the left in the foreground.



Bin Li was working at Thermoking again for part of the summer to transition his efforts on modeling to the Thermoking engineers. They have some full time people with relevant expertise in-house in Minneapolis now so they were able to get a lot further in the transition/handoff of thermal system modeling than previously.

Dr. Alleyne was in Boulder Colorado for about 6 weeks as part of the CU Faculty In Residence Summer Term (FIRST) program. This is a program that brings in external faculty from across the world to interact in different units across the entire university. To my knowledge, it's the only formal visiting faculty program specifically targeted for the summer. It was a good time and a lot was learned.

## 6. Catching up with ARG Alumni.

Rajat Shah writes back to report that he completed his MBA from Michigan and joined a Treasury management program in New York. That is a long way from the Midwest. He says that he job is good but he is completely cut-off from engineering in his new role. His longer-term aim is to head back to India in a good engineering-business leadership role. The rest of his family (Smita and Sarthak) are doing well.

Dr. Sean Brennan reports that his title has been officially changed from Assistant to Associate Professor with tenure. Congrats to you Sean! Well deserved.

Scott Manwaring reports that things are going well at Sandia:

*“Things here in Albuquerque and at Sandia are going great. Slowly but surely learning how to ski, and went out about 8 or 9 times this past winter. Things at work are good. My job is best described as systems engineering for the Advanced and Exploratory Systems department. One of our directors described our role as “managing the trade space” for different weapon system concepts which is the best description I’ve heard. Since coming to Sandia, I’ve been involved with hands-on shock and vibration testing, mechanical design, program management, requirements definition, advanced concept studies, and system behavioral modeling. Pretty diverse, also have had chances to travel to California, DC, and the UK among others. Its not really controls related, but many things from grad school have been invaluable. The ability to take a longer view of a project, the need to set my own deliverables and deadlines, to examine full system behavior, have all been huge assets. At UIUC I really appreciated being able to work with incredibly talented,*

*hard working, interesting people, and that has thankfully carried over to Sandia.”*

Here’s a picture of a mini reunion with Brian, Scott and Tom McKinley in Albuquerque. Tom and his wife Sue Brasmer were out there on vacation and stopped by. Also, Kira Barton was out there when she was interviewing for jobs and managed to grab some time with Brian and Scott. The two pictures seem to have similar backgrounds. Hopefully, there are enough restaurants in Albuquerque so that Brian and Scott don’t have to keep recycling ☺ Seriously though, it’s great to see ARG folks keeping connections going. That’s probably one of the best parts of the people transitioning through this lab.



No ARG Alumni newsletter would be complete with out baby news!! This time it

comes from up state New York. Brandon Hency and Michelle welcomed Ethan Michael Hency on July 3<sup>rd</sup> 2010. He was almost born on the 4<sup>th</sup> of July. Mom and dad are adjusting to life as parents full of *“late night feedings, explosive gas, rapid fire diaper changes, and otherwise having a very cute baby on our hands”*



something, poke me about it and I'll get it in the Winter newsletter. Have a great Fall!!

Also, Bryan Rasmussen and his wife Holly celebrated the arrival of a *\*son\**! Yep, you heard right. After many many girls, the Rasmussen's now have a young man in the family. Below is a picture of young Scott Rasmussen with the one of the many women he'll have in his life



Hope you enjoyed catching up a bit with your former lab mates and those currently in the lab. Please keep sending back news. We love to hear about it! Kids, job, life, whatever. If I missed anyone who sent me