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## Message from the Student Leadership Council

Greetings ERC students! Welcome to another edition of the Smart Lighting Periodic Advisory Memo (SPAM), and hello to students joining the center this semester, grad and undergrad.

As you may know, the Smart Lighting Engineering Research Center (ERC) is a multi-partner, academically-based institute. It is a program, supported ten years by the National Science Foundation (NSF), for the purpose of doing transformational research in the areas of next generation light sources, communications and dynamic optical control. Now, while we can all relate to the want of a simple two step plan that involves 1.) research and 2.) getting paid, it's important to realize that the ERC is a bit more involved than other funding agencies, and that a higher level of student interaction will be expected by comparison. This interaction involves everything from biweekly thrust meetings and student seminars, to annual events, such as the "Industry-Academia Days" conference, and the NSF Site Visit in June. Some of these require no small amount of preparation, and It is not unusual for students to view them as an inconvenience, or maybe even a complete waste of time. Nevertheless, your participation is critical, and to understand why, it is necessary to consider the structure of the center as a whole.

The Smart Lighting ERC is multidisciplinary,

bringing together practitioners of engineering, materials science, physics and other studies.

Accordingly, the projects we work on are just as diverse, involving everything from LEDs, to the systems that drive them, and beyond. In order for an organization of this breadth to function cohesively, it is helpful for all those involved to have a clear understanding of how their work is beneficial to the ERC's mission, and even to other students.

Over the coming months, and especially when we approach the June site visit, you will thus, at certain times, be asked to explain your research as it relates to the center at the so-called "high level". The motivation here is to produce students who understand the big picture, and can convey, clearly and concisely, the impact of their work to a diverse audience. This helps the center look good, but more importantly, you will find it is a downright important skill to master; doing so will help you land success far beyond your time here as an ERC student. For more info, check the student handbook

(<https://slerc.ecse.rpi.edu/display/STUDENTS/Smart+Lighting+ERC+Student+Handbook>). Everyone is encouraged to take a look. Thanks for reading!

We value your input! Send comments and suggestions to [freyb2@rpi.edu](mailto:freyb2@rpi.edu).



## Message from Dr. Karlicek

***“The reality is that LED lighting systems have the potential to be so reliable that First Wave SSL sales will ultimately drive many of the lighting companies that exist today to extinction.”***

One of the interesting things that I have observed over the past several years of our ERC’s operation is that the lighting industry has warmed up to the Smart Lighting ERC’s vision of integrated sources, sensors and controls. When I first arrived at the ERC and was invited to speak at a DOE Lighting R&D Workshop planning meeting, my committee colleagues listened politely to my description of our ERC’s evolving vision for ultra-efficient lighting, improved human health and well-being through illumination spectral control and visible light communication, but looked at me like I was from another planet. I presented the same vision to a much larger community of lighting researchers (mostly from industry) at the actual workshop held in early 2011 and got pretty much the same response.

Over the past three years, our ERC language about First Wave versus Second Wave solid state lighting has been parroted by other organizations, more companies are looking at color controlled lighting off of the black body curve (at least a dozen companies now have products in this space), and synthetic LED skylights are being made in China (a step toward our vision of lighting video fusion). What has changed, you might ask? While I would like to say that our research and vision casting has led this change (and perhaps it has to a degree), I would have to say that the bigger driver is something more primitive and basic – business survival.

The reality is that LED lighting systems have the potential to be so reliable that First Wave SSL sales will ultimately drive many of the lighting companies that exist today to extinction. Lighting business development experts are predicting that “socket saturation” will drive a reduction in global lighting company

revenue in about 5 to 6 years. When LED lighting sales slow to a trickle because bulbs don’t fail fast enough, the surviving companies will need new ways to drive revenue growth. It remains to be seen if the new features and services of Smart Lighting will be sufficient to create sustainable business models, and much of that depends on the research on futuristic services of advanced lighting systems now being conducted in the ERC and in other academic and industrial laboratories around the world.

I just attended the SOLED conference in Tucson Arizona this week to talk about Smart Lighting. Interesting talks on color tunable lighting for artwork viewing and even research on fixture designs with clever electro-mechanical optical beam shaping capability (spot to diffuse with normal and angled emission tuning) was presented. In informal discussions with a senior Philips researcher from Eindhoven after my session, the matter of color tunable lighting came up and we discussed the Philips Hue bulb product. It is driving enough revenue to drive further research on color tunable lighting systems, but even the Philips person admitted that after getting the system for their home use, it quickly became boring (like with most toys, even lighting toys). He said that what was needed was a system that automatically estimated and delivered the kind of lighting (color, intensity and beam pattern) based on minimal human interaction. They are working on it. So are we – we call it the “right light, where and when it is needed,” and thanks to your work, that vision remains a worthwhile goal for the Smart Lighting ERC.

~Bob

## Upcoming Events

### Smart Lighting ERC Speaker Series (Dec 10, 2013, 2:30-4:00 p.m. EST)

Matt Laherty, Business Development Manager, Cisco, will present "Lighting Transformed: How Innovation Will Create New Opportunities in Lighting." The event will be a live webinar (on site location is RPI, JEC 3117).

### Special Event: Student Seminar Series (December 17<sup>th</sup>, 2013)

December's SLC hosted student seminar series will feature a special guest presenter Gary Stine, who is professionally trained in public speaking. This event will be helpful to all students as a way to improve presentation of research goals and ideas. Everyone is encouraged to attend!

### Smart Spaces: 5<sup>th</sup> Annual Industry-Academia Days (February 12 – 13, 2014)

This is the annual event where ERC members will review their work with our industry partners and advisory board. More info regarding posters and other student responsibilities will be posted as we approach the event.

### Perfect Pitch Competition (February 11-12, 2014)

The perfect pitch competition will be carried out the night before the Industry Event, and finalists will be selected to perform their pitches to industry members the next day. Look for more info on this as we get closer to the event.

## Smart Lighting News

Here's the latest news dispatch from [solidstatelightingdesign.com](http://solidstatelightingdesign.com). All stories can be found [here](#):

- Intematix Introduces Remote Phosphor Product for 150W LED Retrofit Lamps
- Cree LED Lighting Delivers Energy and Maintenance Savings at Albuquerque Convention Center
- Eaton Cooper's SkyRidge Fixtures for Ambient Applications Use WaveStream LED Technology
- Dialog Semiconductor and Sengled Lighting Partner for Development Of Ledotron-Compliant Smart Lighting Solutions
- Stone Brewing Co. Deploys Digital Lumens Intelligent LEDs
- Revolution Lighting Technologies Acquires Tri-State LED, a Distributor of Seesmart LED Lighting Solutions
- Oxford Historic Cinema and dpa Lighting Receive Project Award for LED Façade Lighting
- Action Services Group Completes LED Lighting Retrofits for Music & Arts
- Be Afraid. Be Very Afraid... The 'Super-Driver'

## Contact Info

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### Research Thrusts

If you would like to get in touch with ERC members in a specific research area, please contact Michelle Simkulet: [simkum@rpi.edu](mailto:simkum@rpi.edu)

### Comments and Suggestions

For comments or suggestions regarding SPAM, please contact Brian Frey: [freyb2@rpi.edu](mailto:freyb2@rpi.edu)

### Cover Photo:

<http://beforeitsnews.com/science-and-technology/2013/11/philips-hue-continues-to-dominate-smart-lighting-with-new-br30-gu10-and-disney-lights-2649702.html>



## Student Achievements

### ***Veera and Arjun Saxena Fellowship in Microelectronics*** (Anton Tkachenko)

- Based on grade point average, overall performance, and faculty recommendations, Anton Tkachenko of RPI was the ECSE student selected to receive this annual award, which came with a cash amount of \$3,000. Congratulations, Anton!

### ***SPIE Student Travel Grant*** (Md Mottaleb Hossain)

- ERC Graduate Student Md Mottaleb Hossain of UNM was awarded a prestigious SPIE Student Travel Grant to present his work "*Theoretical characteristics of 1.55  $\mu\text{m}$  InN based quantum dot laser*" at the SPIE Optics & Photonics Conference, San Diego, CA, USA, August 25-29, 2013. Neat!

## Much Needed Distractions...

[www.coolest-gadgets.com](http://www.coolest-gadgets.com) – Some of the best and worst inventions you might not have heard of.

[www.xkcd.com](http://www.xkcd.com) – A web comic of romance, sarcasm, math and language.

<http://whatshouldwecallgradschool.tumblr.com/> - A running collection of hilarious gifs about grad life. There's probably something for everyone here.

[www.phdcomics.com](http://www.phdcomics.com) – In case you thought you're alone. Enjoy!

### **A Guide to Academic Relationships**

Same department, different field	=	"Colleague"
Same topic, different field	=	"Collaborator"
Same field, different topic	=	Conference Buddy
Different field, different topic	=	Who cares?
Same field, same topic	=	Bitter Enemy (a.k.a. also "Collaborator")

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"Piled Higher and Deeper" by Jorge Cham

## Other Student Accomplishments

Rensselaer Polytechnic Inst.

### Journal Publications

Ying Li

An Mao (graduated)

Anqing Liu

