Science Cafes @ the LRSM

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Penn MRSEC Outreach Timeline

- Research Experience for Undergraduates 1989
- Monthly Lecture Series for Teachers 1993
- Pennsylvania Summer Science Initiative, PSSI 1994
- Science of Philadelphia TV program 1998
- Partnership for Research and Education in Materials 1999
- Research Experience for Teachers 1999
- Summer research for high school students 2000
- Science in Archaeology 2003
- Research Collaboration with S. Africa 2004
- Materials Science high school course 2008
- V/C lectures to Schools via MAGPI 2009
- Thermal Analysis Community
- Science Cafés 2010
- Teachers Workshops 2010
- Philly Materials Day 2011
- Girard College 2011
- Philadelphia Science Festival 2011

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LRSM Science Cafes

- Started 2010 (Inspired by NOVA)
- Evening talks in a pub setting for the general public
- Materials-related topics
- 2 per month during school year, 18 per year (~100 to date)
- We now videorecord them
- Philadelphia, PA and Wilmington, DE

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Genesis of our Science Cafes

- NOVA's series on Making Stuff with David Pogue in 2010. Series of materials programs: Stronger, Smaller, Smarter, Cleaner
- This resulted in us arranging several Science Cafes in Philadelphia with Penn faculty and starting the Philadelphia Materials Day - A joint effort between Penn and Drexel Universities which draws 1000-1500 K-12 students and parents to the campus event in February.

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Setting up a Science Café

- Choose a venue - Pub or Coffee House. Should have a separate room or restricted area away from the bar.
- Hold it on the quietest night. The pub appreciates the extra business.
- Talk time 30-40 minutes max. with plenty of time for questions after.
- Start time (for us) 6:00 pm Philadelphia, PA and 7:30 pm Wilmington, DE
- Choose speakers and topics carefully. It should be of general or current interest. Emphasize to the speaker that it is for a general audience not an APS meeting. No complicated graphs or equations. Videos help. Note- this is a good opportunity for new, young faculty to get outreach experience.
- Use a simple, catchy title.
- Video record the talk and put it on your website.
- Advertising: develop an e-mail data base of people who are interested. Prepare a flyer with title, speaker, short abstract, and illustration. Post on web sites, Facebook, etc. and have the pub circulate the information.

Venues

- **Wilmington, DE**
  - Stoney's British Pub 2010-

- **Philadelphia, PA**
  - The Dickens Inn (later The Dark Horse) 2011-
  - World Café Live
  - St. Declan's Well, local Irish Pub (went bankrupt)
  - The University Cub (located in the Inn at Penn Hotel (changed management))

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Typical Audience (Range 25-65)

- Age - Early twenties to seventies
- Heterogenous audience- old/young, male/female, scientist/non-scientist
- Retired scientists and engineers, DuPont, Astra Zeneca, Certainteed
- Industrial scientists at DuPont, Axalta, Chemours, Astra Zeneca, Brightfields, Gryphin
- University faculty, staff, and students from Widener, Delaware, Immaculata, Penn, Drexel, and other local colleges
- Science teachers from DE and PA
- Lawyers and business people
- Meet Up group bring in younger people
- General public

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Fall 2014

- **Stoney's British Pub, Wilmington DE**
  - Sept. 8 Eric Hume, Penn Orthopaedics
    "50 Years of Hip Implant Materials"
  - Oct. 6 Dillon Brout, Physics
    "Advances in Race Car Vehicle Dynamics and Race Strategy"
  - Nov. 10 Karl Adamsons, Axalta, Inc
    "Art Preservation over the Last ~5000 Years"
  - Dec. 8 Alain Plante, EES
    "The Carbon beneath our feet"

- **St. Declan's Well, Philadelphia, PA**
  - Sept. 3 Matt Lazzara, CBE
    "Personalized Medicine for Cancer"
  - Oct. 15 Igor Bargatin, MEAM
    "Producing Solar Electricity by boiling water and Electrons!"
  - Nov. 5 David Salas, Chemistry, Rutgers
    "3-D Printing"
  - Dec. 10 Nicholas Kybert, Physics
    "Nanotube 'Noses': Putting sniffer dogs out of business"

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The Laboratory for Research on the Structure of Matter

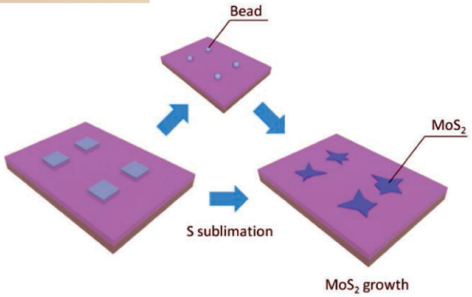
An LRSM Science Café

Beyond Graphene: MoS_2, a New Platform for Science

October 24, 2016
7:30PM

Carl Hugo Naylor
Physics, University of Pennsylvania

Stoney's British Pub
3007 Concord Pike
Wilmington DE



Graphene, the once acclaimed holy grail of materials in the two dimensional world has attracted a tremendous amount of interest in the past decade. However, the more we learn about this material, the more we realize the limits in its applications. Hence, the scientific community's rush to discover the next Graphene. MoS_2 has emerged as a true potential candidate to fill the big shoes of Graphene. In my talk, I plan to introduce MoS_2 and how its exciting properties can be applied towards novel systems.

These programs are free and anyone who is interested is invited to attend. No purchase is necessary.

For further information contact: **Andrew R. McGhie**
215-898-6461
mcghie@lrsm.upenn.edu

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An LRSM Science Café

A Fantastic Voyage – From Bacteria to Micro-robots

April 25, 2016
7:30PM

Paulo E. Arratia
University of Pennsylvania

Stoney's British Pub
3007 Concord Pike
Wilmington DE

In 1966, the science fiction flick Fantastic Voyage had a submarine crew shrunk to microscopic size to travel through a person's body to fight brain disease and remove a clot. Traveling in their miniaturized submarine, Proteus, the crew fights off the body's immune system and successfully completes their task. Today, scientists and engineers around the world are trying to make this voyage a reality – or at least the good parts of it. In this talk, I will review a few fundamental ideas and concepts in trying to design microscopic sized robots and the many challenges that still need to be overcome. In particular, I will discuss the main challenges in achieving efficient motility or propulsion as the system size (i.e. submarine) shrinks down to the micro- and/or nano-scale. I will argue that one can learn quite a bit from nature. Microorganisms such as bacteria, algae, and sperm cells have learned how to actively move in a diverse set of environments. By studying these biological systems in detail we may be able to mimic and reverse engineer their success.

These programs are free and anyone who is interested is invited to attend. No purchase is necessary.

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LRSM Science Café

at the

LRSM

The Laboratory for Research on the Structure of Matter

Saint Declan's Well
Irish American Pub

3131 Walnut St., Philadelphia, PA

FREE EVENT
no purchase necessary

Wednesday, February 18, 2015
6:00pm

"Rare Earth Metals: I-phones to Alien Life"

Eric Schelter
Chemistry Department
University of Pennsylvania

The rare earths elements: La–Lu, Y and Sc are irreplaceable components of compact fluorescent light bulbs, wind turbines generators, and hybrid and electric vehicles. For application, the rare earths must be separated into pure compoundsfrom their composite ores. China currently produces ~97% of all rare earths materials, though its geological holdings amount to ~37% of the estimated total global supply. The global market for rare earth elements is currently in crisisdue to a reduction of export quotas by the Chinese government. The talk will encompass the many applications of rare earths in modern society, the current global supply chain and outlook for this critical class of elements.

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World Café Live

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St. Declan's Well

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University Club

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MRSEC Penn

Stoney's British Pub

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Conclusions

- Suggestion- Think about the viability of a Science Café in your program
- It is inexpensive and does not take too much time to organize
- It can be video recorded for posterity
- It is an outreach program for the general public which falls under the broader impact category
- It is FUN

People we make happy

- The pub owner and waitstaff
- The speakers- they all are pleasantly surprised by their reception
- The audience – many of whom are now regulars
- Our director- who encourages all outreach efforts
- The NSF (presumably) as it is outreach to the general public and it promotes greater understanding of the usefulness of materials research.

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