

First GEAR Retreats held at Urbana-Champaign campus

Not even triple-digit temperatures could dampen the enthusiasm of the participants last summer when the Department of Mathematics at Illinois hosted two retreats for over 100 members of the GEometric structures And Representation varieties (GEAR) Network.



Participants at the GEAR Retreat 2012 gathered on the steps of Altgeld Hall.

Created in September 2011 with a five-year, \$2.2M grant from the National Science Foundation, the GEAR network is centered at the University of Illinois under the direction of Steve Bradlow. The network has two other main hubs at the University of Maryland (directed by William Goldman, Richard Wentworth, and Anna Wienhard) and Stanford University (Steve Kerckhoff) and additional nodes at nearly 50 locations in the U.S., Canada, Europe, India, and Singapore. The network links together a diverse group of mathematicians with common research interests in the interplay between the topology of low-dimensional spaces and the geometric structures that can be built on them.

The main GEAR Retreat this past summer brought network members together in one place to explore their common interests and to discuss the network's agenda for the coming years. This was preceded by a two-week Junior Retreat for graduate students and postdocs in the network.

Reflecting the broad range of interests represented in the GEAR network, both Retreats were structured around five themes: Dynamics on Moduli Spaces,

Geometric Structures and Teichmüller Spaces, Higgs Bundles, Hyperbolic 3-manifolds, and Special Representations.

Designed to build bridges between the different interest groups, the Retreat program included broad survey talks as well as activities such as an Everything You Want To Know (EYWTK) question-and-answer session, and a panel discussion. The EYWTK session gave an opportunity for those with expertise in one area to pick the brains of the experts in other areas. The panel discussion focused on the best ways to exploit the resources of the network and also on the mathematical agenda for the coming years.

Junior Retreat mini-courses in all the main theme areas prepared graduate students and postdocs for the Retreat. Each mini-course included four hours of problem sessions which exit surveys showed were among the most popular features of the Junior Retreat. Other popular features included a Mathematical "Speed Dating" session at which participants got to find out about each other's (research) passions, and a trip to the Champaign County Fair that by all accounts changed the way the non-U.S. visitors think of deep-fried foods.

With the help of the Online & Continuing Education/ATLAS Digital Media group on campus, all Retreat talks were live-streamed over the web and recorded. The live-streaming website included an interactive comment section where viewers could submit questions or comments in real time. The recorded talks are permanently available on the GEAR website at gear.math.illinois.edu. Some of the talks have already been viewed over 600 times.

The local organizers for the Retreats, Chris Leininger, Jayadev Athreya and Spencer Dowdall, were enthusiastically assisted by graduate students Caglar Uyanik and Rasimate Maungchang, and the staff of the mathematics department.

The next GEAR Retreat will be hosted by the University of Maryland hub in 2014.



The prize winning entries in the Champaign County Best Bundle competition apparently included one with visiting GEAR Retreat members as fibers.