

Students learning liquid crystals are found even where we least suspect

We know that thermotropic liquid crystals are used in displays, sensors and in a number of areas. We have also known for a long time that lyotropic liquid crystals are important in biological systems. Hundreds of these examples are mentioned in publications such as Glenn H. Brown and Jerome J. Wolken's co-authored book about Liquid Crystals and Biological structures. Recently, papers (many of them published in *Science and Nature*) show new examples, such as spider silk during the spinning process. "We are always pleased to see these examples, but we are not really aware of how many are actually out there yet and how many are really liquid crystals," Antal Jákli, a senior research fellow of the Kent State University Liquid Crystal Institute (LCI) said.

Two students, Jamie Liscotti and April Yosinski from Community College of Allegheny County, Monroeville, PA, are determined to search the internet for new examples and discuss them with their Professor Sulakshana Plumley, former graduate student of Alfred Saupe, professor emeritus of the LCI, and Jákli.



Antal Jákli demonstrates the unique flow properties of the well-known liquid crystal 8CB to April (left most), Jamie (second from left) and Sulakshana (right) during their visit to the LCI.

Jamie and April are participating in the Congressional Earmark Grant: Center for Liquid Crystal Research and Education (CLCSE), recently awarded to Kent State University with Principal Investigators: John West, Interim Vice President (Research and Graduate Studies), LCI Director Oleg Lavrentovich, LCI Associate Director Peter Palffy-Muhoray, and Antal Jakli, (Liquid Crystal Institute), Jim Gleeson and Sam Sprunt (Department of Physics) and Chris Woolverton (Department of Biology).

Neither Jamie or April have particularly strong backgrounds in physics, but they are fascinated by the liquid crystalline materials and are devoted not only to search and learn about examples in liquid crystals, but also determined to be involved in real experiments. "They will join us in May for a few weeks, doing real laboratory investigations on the subject they will pick up among the examples they find during the initial search," Jakli said. The observations will then be analyzed at their home with the local help of Sulakshana Plumley and the remote help of Jákli. "We hope that this project will lead to a new piece of useful knowledge and possibly a publication," Jákli said.

"This work may prove to Jamie and April that physics is not boring and made only for old white men with strong accents (a common stereotype of students), but something that all bright and interested young people can practice joyfully and successfully (an example set by Sulakshana)," Jákli said.

Jákli explains, "This is the exact purpose of the grant: to attract more and more young people to learn and get excited about liquid crystals. To get them involved in serious, yet fun research and have them realize that research is one of the most important things in our lives."

During their one day visit Jamie and April toured the LCI, visited the Kent State Physics and Biology departments, learned the very basics of liquid crystals (see picture), and even attended the LCI seminar where they were so inspired by the exciting and enthusiastic talk given by Ms. Ingrid Russeau, graduate student of University of Connecticut, that the first question was asked by April. ("A nice and brave thing that our graduate students can replicate in the future," Jakli said.)