http://www.magnet.fsu.edu/education/teachers/resources/supernet/index.html

• An educational network connecting scientists and teachers
• Explore the *emergent universe* through inquiry-based activities.

**Mentoring & Outreach**

• Teachers work alongside leading scientists throughout the year.
• From cutting-edge research to the classrooms
• Continuing professional teacher development

*SuperNet is an educational outreach project of the Institute for Complex Adaptive Matter (ICAM), with its home at the National High Magnetic Field Laboratory at Florida State University*
Materials Development

Development of materials for teaching high school students through participation in inquiry-oriented investigations and web-based data analysis through on-going teacher professional development.

Topics

• Initially: from superconductivity, electricity and magnetism,...

• Later: depth in sets of topics within condensed matter physics
  FT-ICR for proteomics
  Probe currents for $T_C$ of “new” materials

• Long term: topics relating to emergent behavior in matter and society.

Nb$_3$Sn filaments in Cu
Modules for Teachers

A main focus of SuperNet is the development of modules created through collaboration among faculty at partners institutions, teachers and students.

Current and planned modules include:

- Superconductivity web-based Treasure Hunt
- Meissner Effect demonstration, Expanded Script @ July 07 AAPT
- Thermal energy, temperature, and heat transfer
- Phase transitions: phenomena at temp. “scalings”
- Structure: From carbon to carbon nanotubes
- Conductivity of materials: metals, insulators, superconductors
- Quantum mechanics: 2 slit experiments to qubits; tunneling
- Application of FT-ICR proteomics in biology classes
- Web-based data sets to explore TC with probe currents

Superconductivity – an example of emergent behavior – can be explained by demonstrating the Meissner Effect.
Why SC? Why This Demo?

Peering into the body without cutting it open

Traveling hundreds of miles per hour in a levitated train

Steering antimatter moving at the speed of light

Expansions/Extensions
Teacher Workshops

• **MagLab Workshop I**: Held January 30, 2007
• **MagLab Workshop II**: Held May 1, 2007
• **MagLab Workshop III**: TBA, January 23, 2008
• These workshops have drawn fifteen teachers from nine area middle schools and high schools.

• **Presentations by Magnet Lab Scientists** (can be downloaded from the SuperNet Web page)
  
  - **Metals, Magnetic Fields and Superconductors**, Nick Bonesteel
  - **Superconductivity: From Physics to the Applications**, David Larbalestier
  - **The Science of High Magnetic Fields**, Chris Wiebe
  - **Electricity and Magnetism, from Early History to the Latest Research** Greg Boebinger
Pilot Phase: Principal Participants

**Florida State University (Magnet Lab: “The Hub”)**

- Vladimir Dobrosavljevic – Scientist
- Pat Dixon – Outreach (NHMFL/CIRL)
- Brian McClain – Lead Teacher
- Nick Bonesteel – Scientist
- Chris Wiebe – Scientist
- Irinel Chiorescu – Scientist
- Greg Boebinger – Guest Speaker

**FermiLab and Illinois**

- Marge Bardeen - Outreach
- Jeff Rylander – Lead Teacher
- Phil Sumida – Lead Teacher
- James Carrubba – Teaching Assistant

**Ohio State University**

- Nandini Trivedi – Scientist
- Mindy Wright – Outreach Lead Teacher
- Andrew Heckler – Scientist
- Tom Lemberger – Scientist
- Bruce Patton – Scientist

A teacher searches for a kernel of truth in his project on irradiated popcorn.

What floats your squash? Teachers examine the mysteries of mass, density and veggies.
SuperNet Management Vision:

*Inspired by QuarkNet*

Management Chart

Advisory Group — 5 PIs — 5 Staff Teachers — Outside Evaluators

- Center 1
- Center 2
- Center 3
- Typical Center
- Center 49
- Center 50
- Center 51

Mentors — Teacher-Leaders

Teachers
Thank You 😊

If you would like to discuss and maybe “sponsor” a SuperNet node at your institution, you can:

• See me, Brian McClain; or
• Check the Education link of the NHMFL; or
• Email vlad@magnet.fsu.edu
• Google us at: supernet superconductivity