Students and observationally based research

start small, think big, and everyone wins

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Dr. Petra Klein
Jose Galvez

University of Oklahoma

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Introduction

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- Highlight issues and current ~~solutions~~ duck tape
- Provide examples of links between education and research
- Touch on the future direction of our endeavors

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Instructor

The benefits of using observational data in the class room can be achieved by combining course materials and personal research aspects, when appropriate, without sacrificing course goals.

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- Arrived at current system of labs after decades of iteration and at least four course instructors

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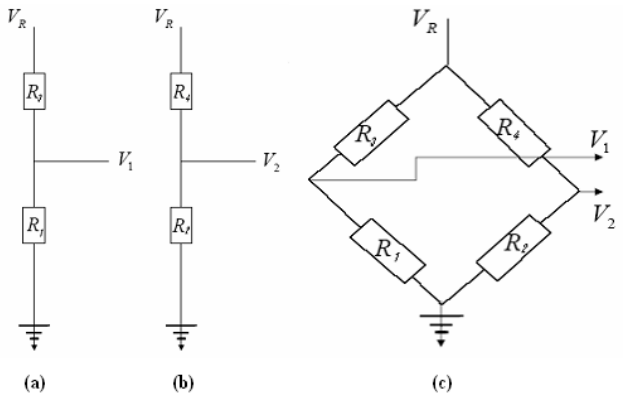

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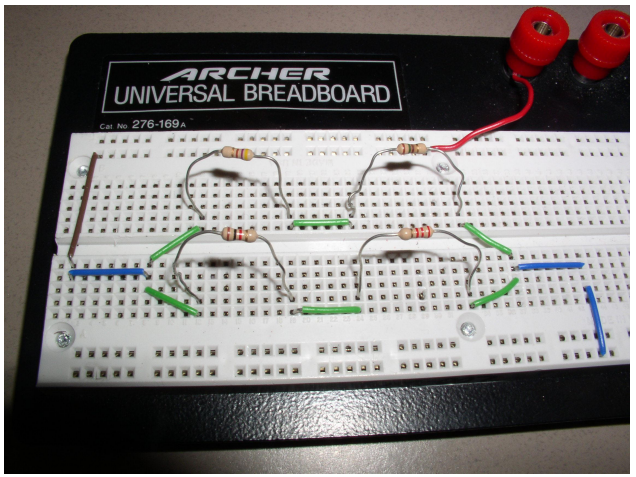

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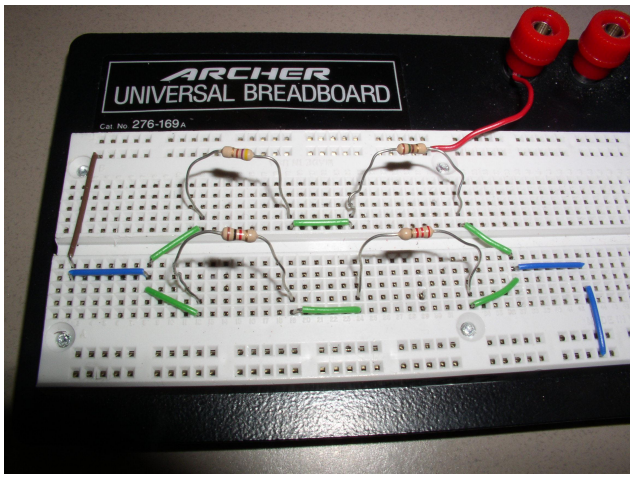
- Verify Ohms and Kirchoff's circuitry laws

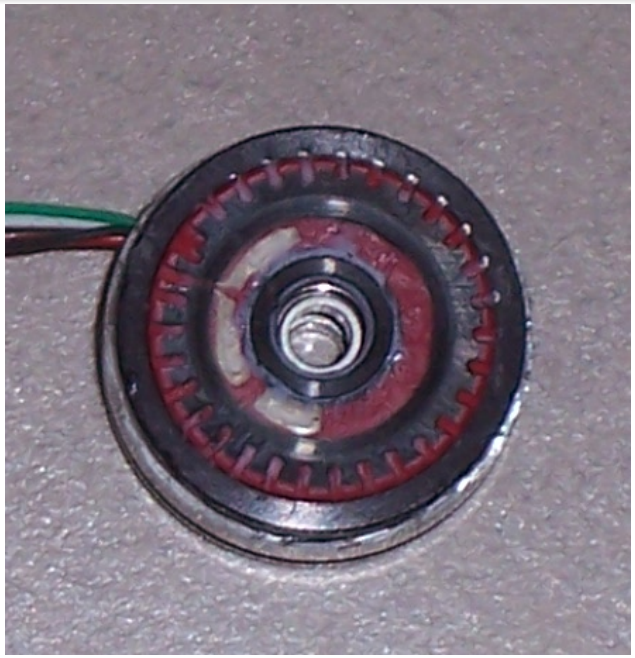


Lab 2

Goal

To gain familiarity with and address the subjective nature of the process of static calibration

- Basics of circular potentiometers



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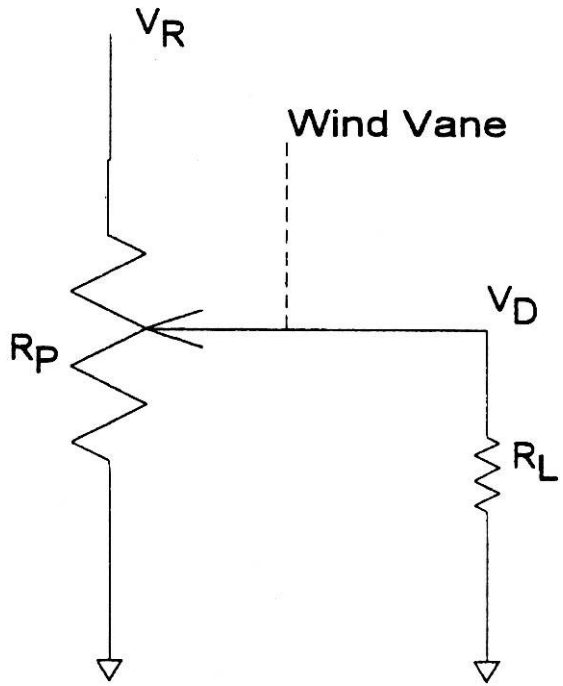

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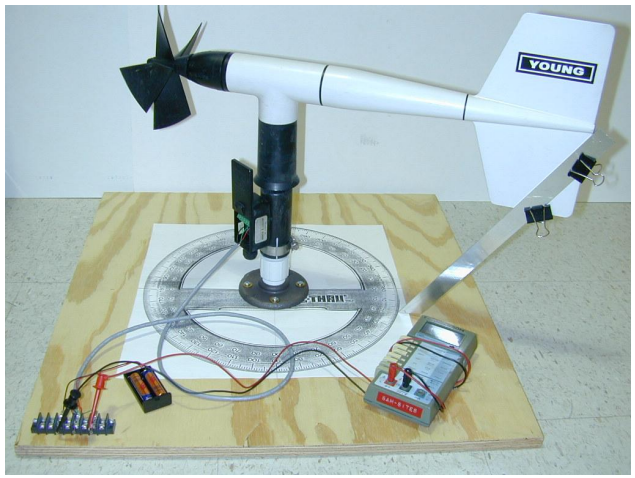

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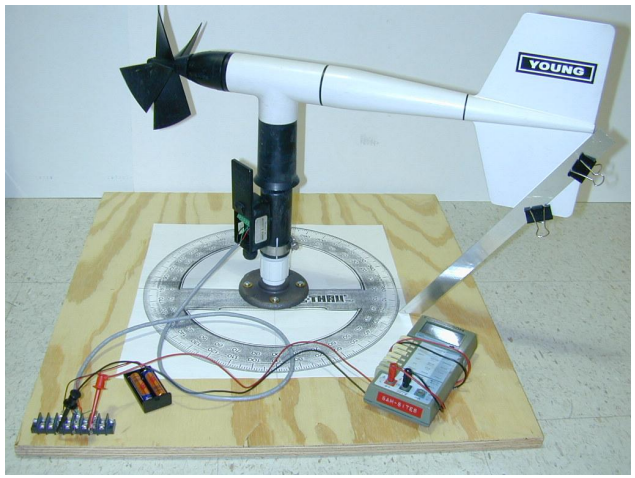

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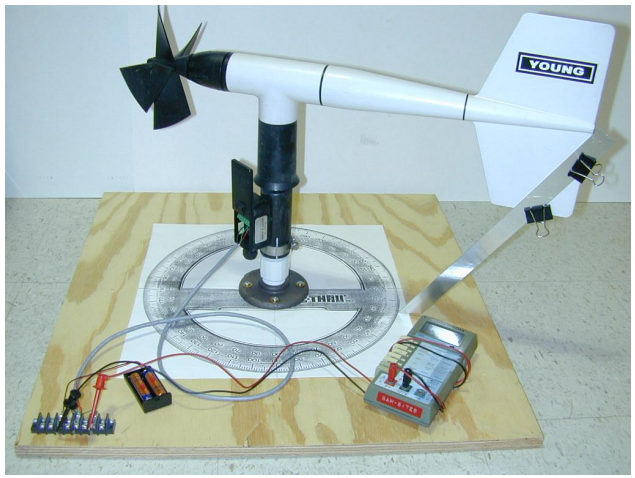
  - direction is related to voltage via linear regression



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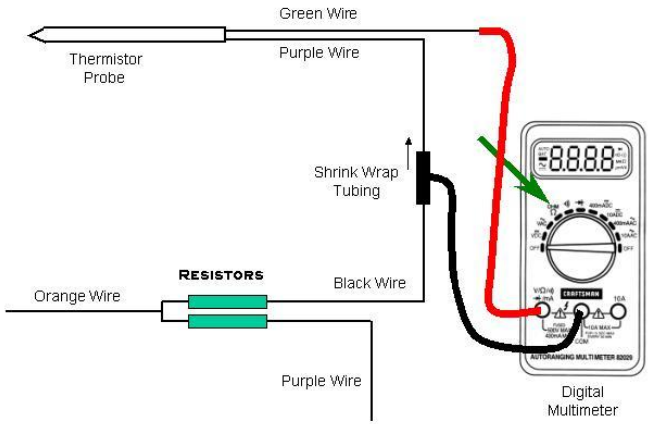
Determine if a thermistor needs to be recalibrated

- Statically compare output from two sensors (one 'reference', one 'questionable')



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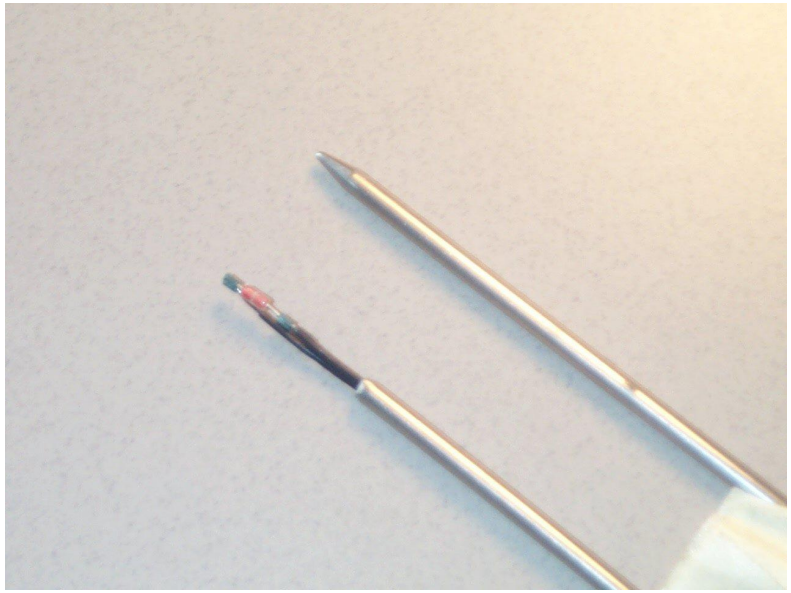

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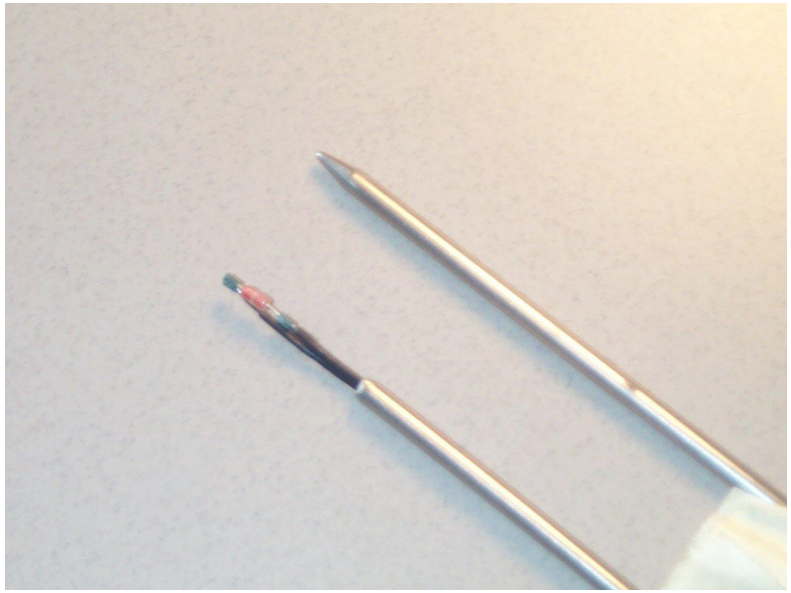

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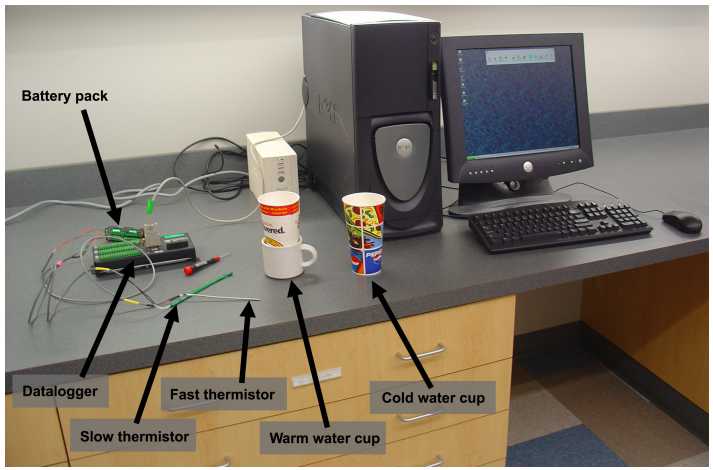

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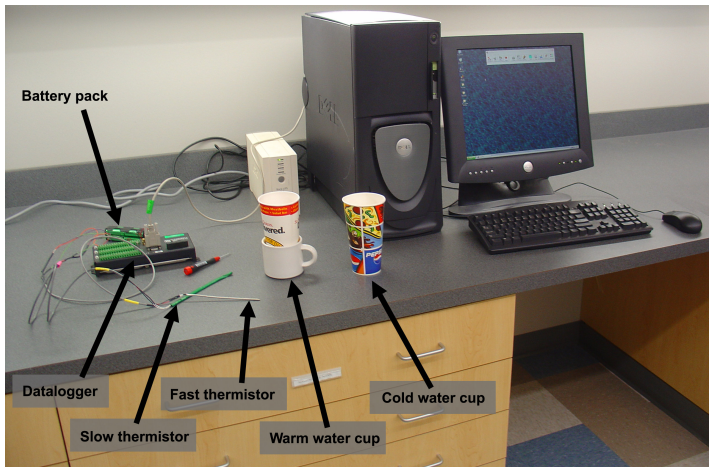

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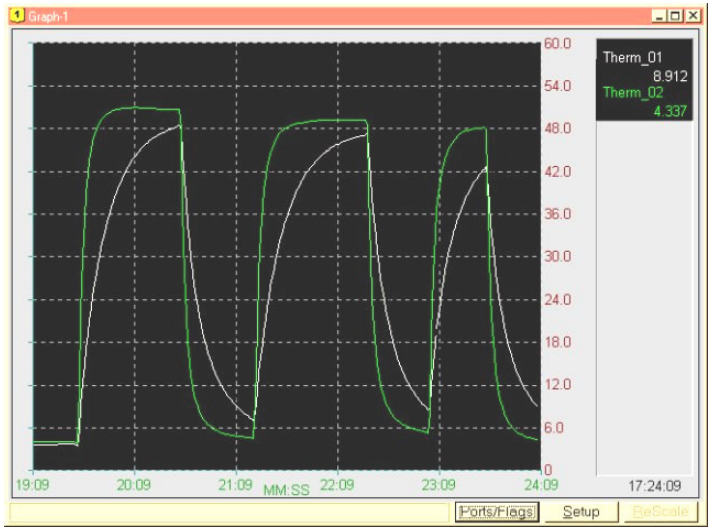

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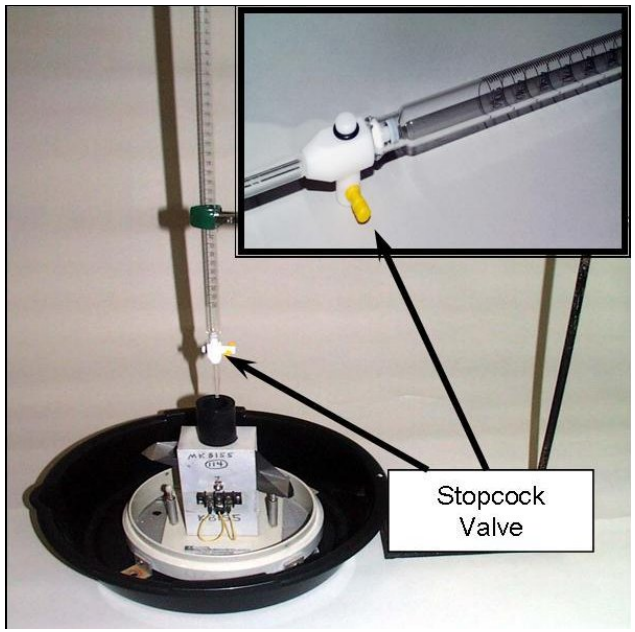

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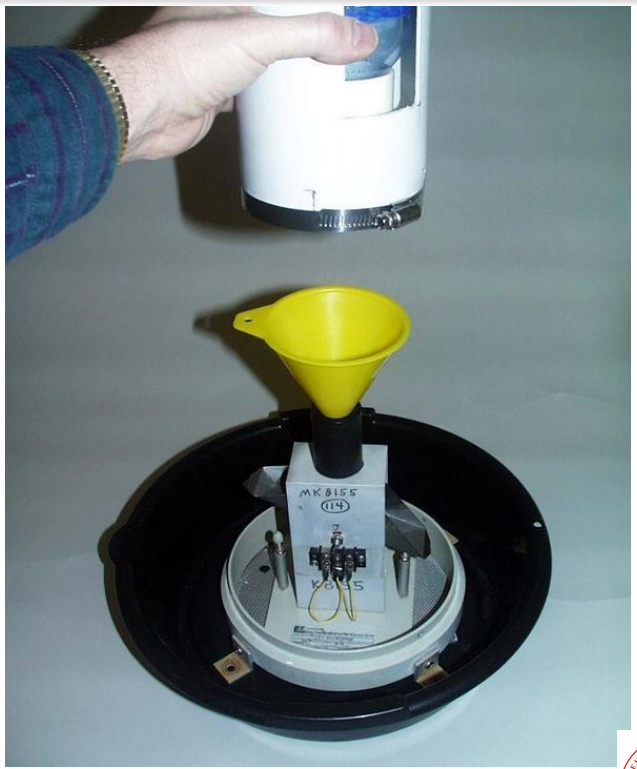

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- Great, now what? I can troubleshoot a circuit and check the calibration of a potentiometer...and?

Instructor reaction

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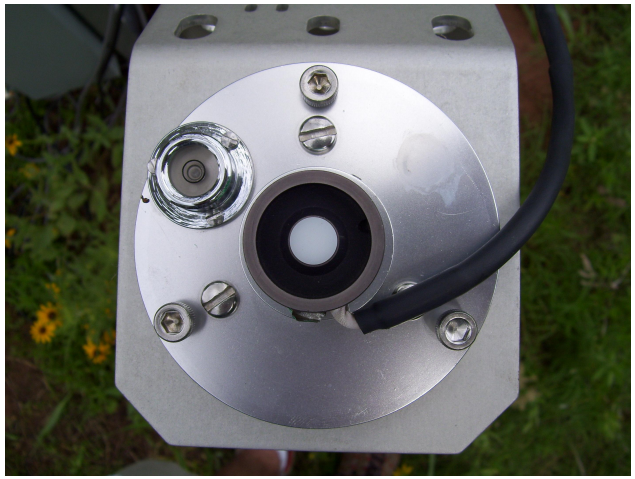
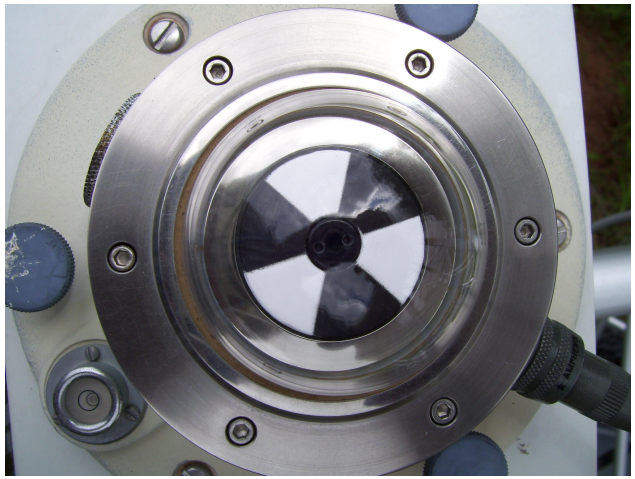
- Conclusion - even with 'hands-on' approach, lack of 'hear-and-now' motivation is a show-stopper
- Solution - at the risk of overloading the students, add semester long projects that include the planning, collection, and analysis of data

Long term projects

Long term project 1 - Sunshine

- Focus on shortwave radiation





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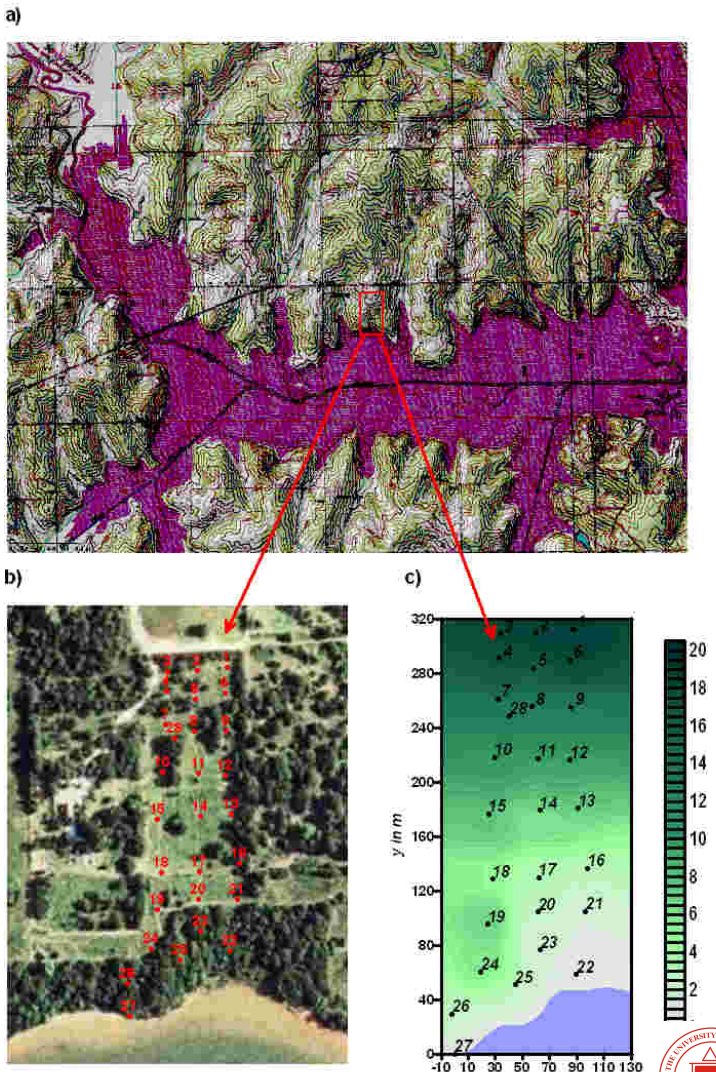

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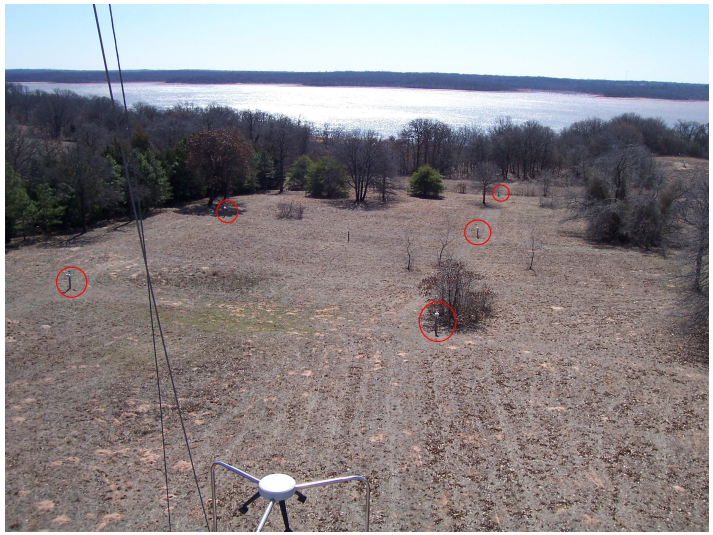

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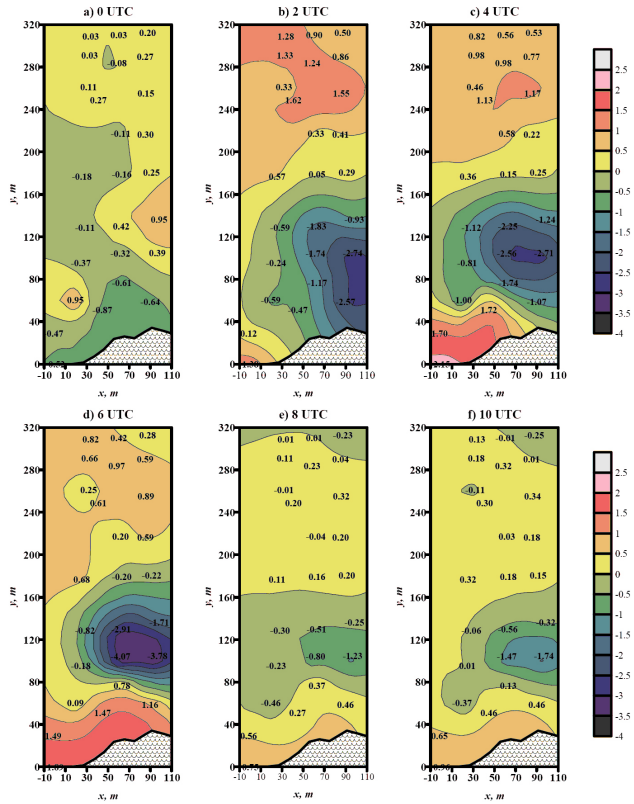

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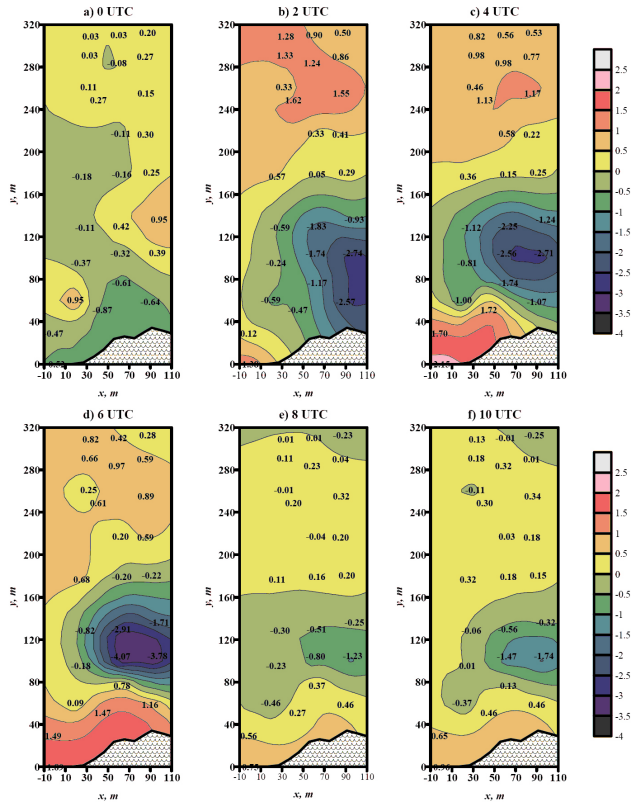

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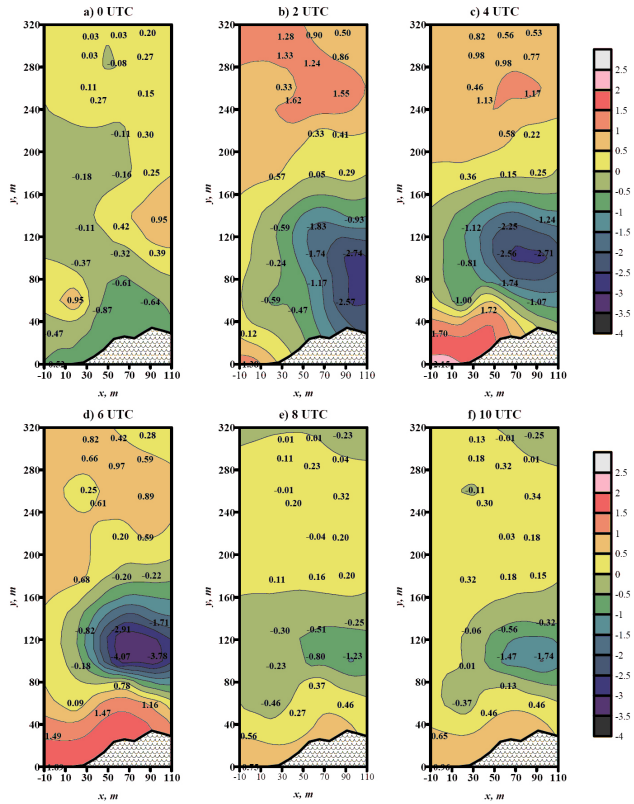

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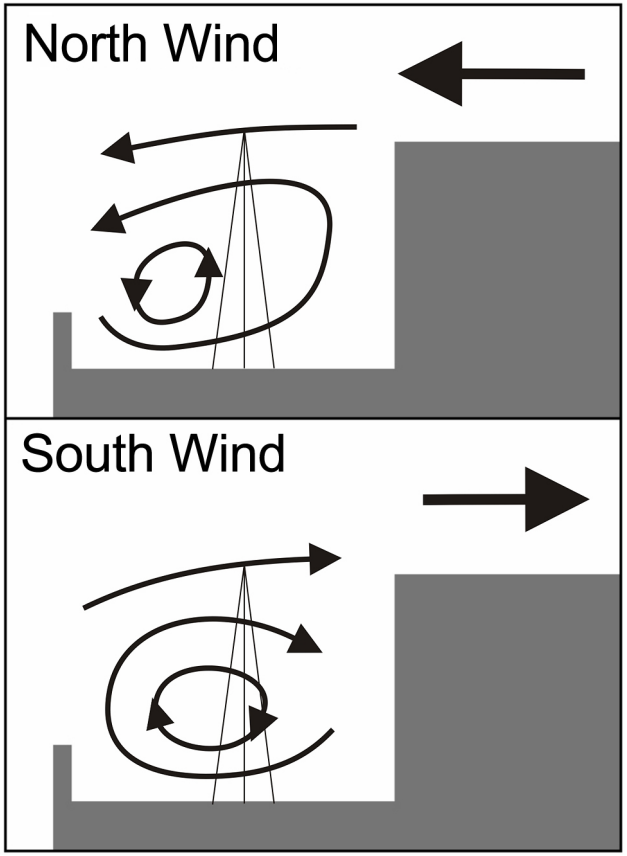

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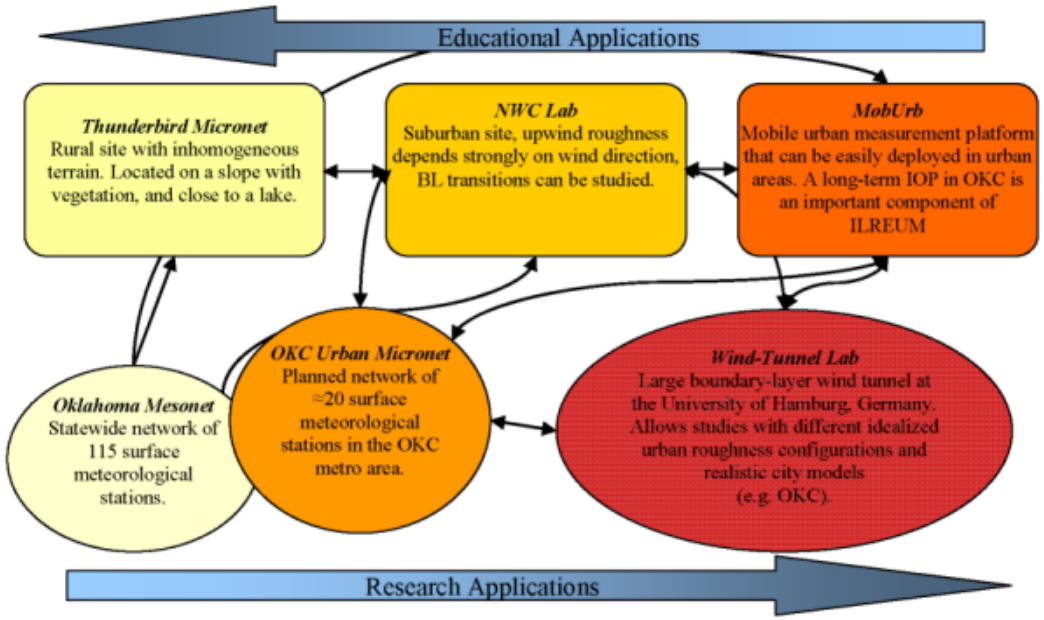

ILREUM - The next step

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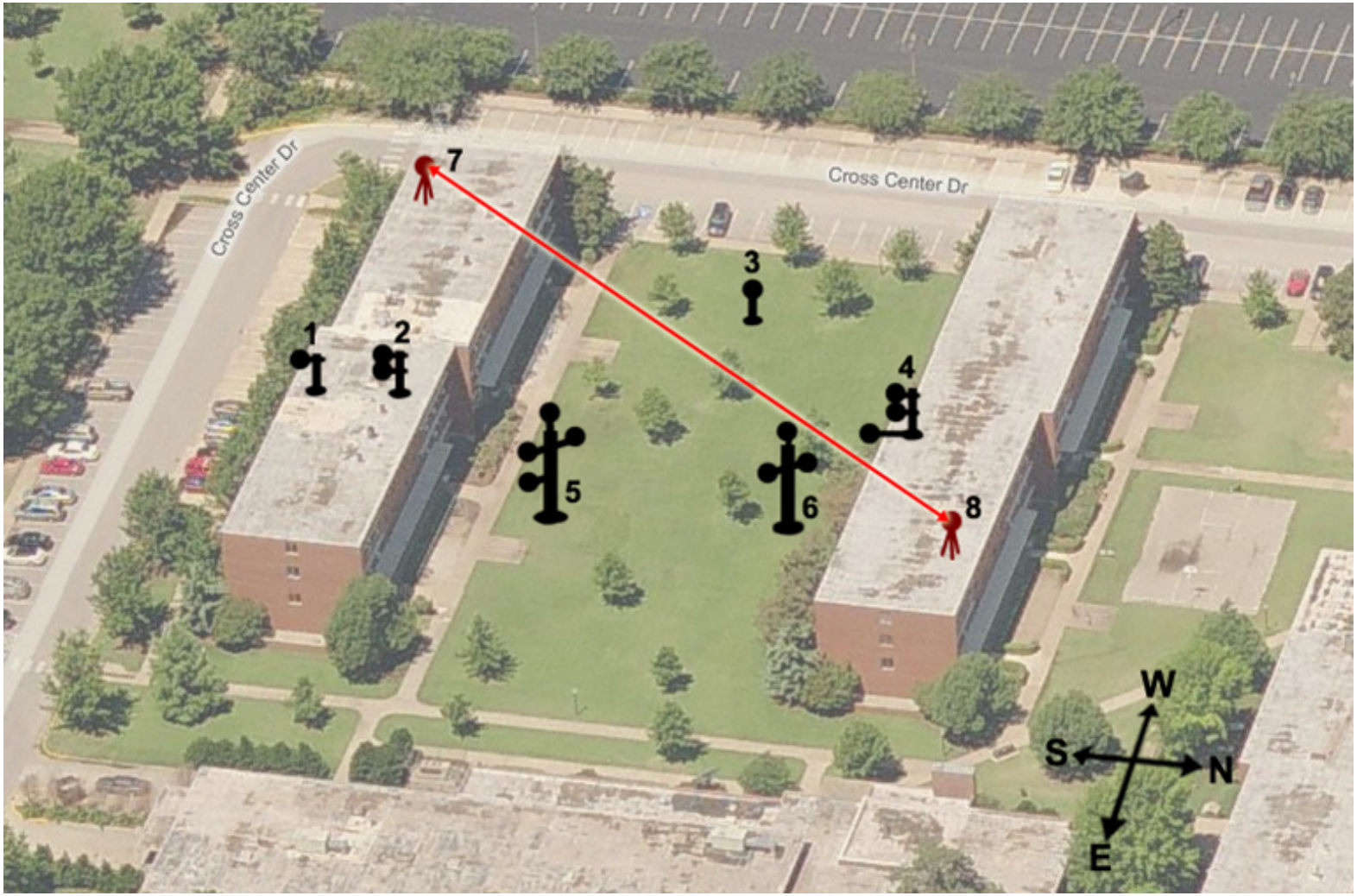

Questions?

- Innovative Laboratory for Research and Education in Urban Meteorology (ILREUM)
- Career award funded by the National Science Foundation (NSF Grant ATM054788)
- http://micronet.ou.edu/ilreum/