Telelab: Broadcast Your Scientific Discoveries

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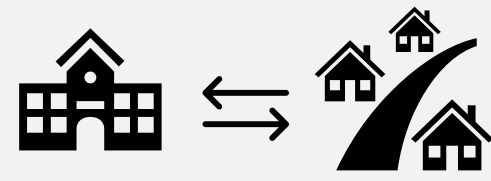[1]Institute for Future Intelligence   🌐: intofuture.org   [2]VHS Learning   🌐: vhslearning.org

Introduction: From School To Community

To engage youth in global challenges such as energy issues, students' own community can serve as personally relevant venues for scientific inquiry. For example, after students learn about heat transfer in school, they can use this knowledge to inspect the energy efficiency of their own schools and public buildings in their neighborhood.

To bridge the gap between school science and citizen science, students need **scientific instruments** that can be used both in and out of school and **a community** to share their discoveries.

Bridging Formal And Informal Science Learning

Thermal imaging is a useful tool for science investigations both in school and out of school
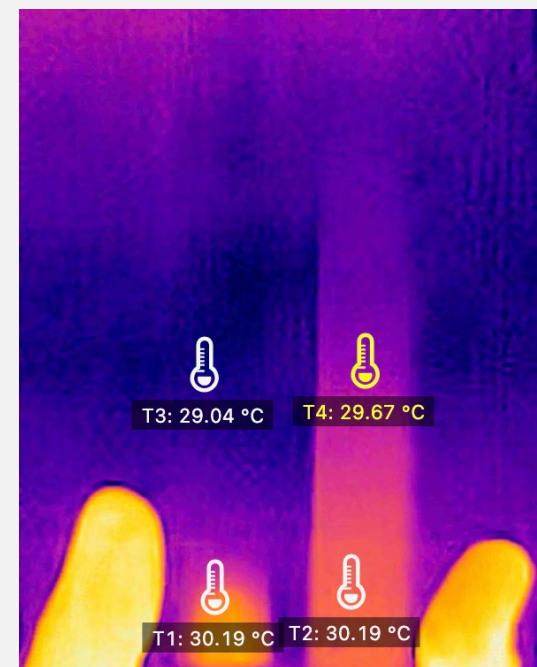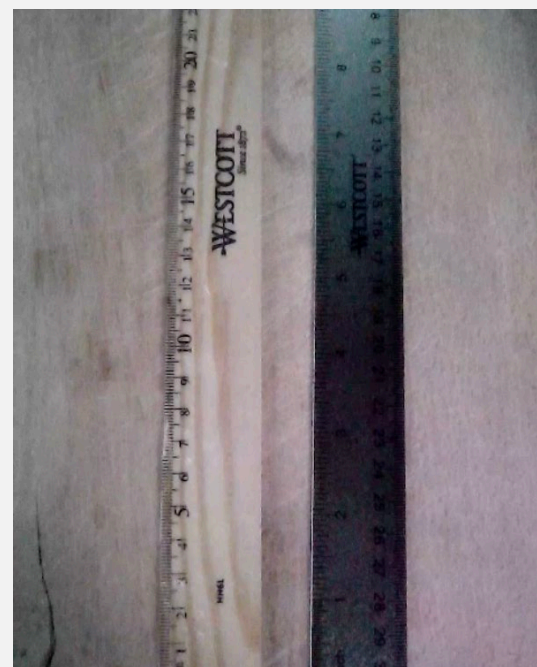
In school: visualizing thermal conduction. Students press their thumbs on a wooden ruler and a metallic ruler. IR imaging shows that metal conducts heat better than wood (an example of learning through embodied cognition).
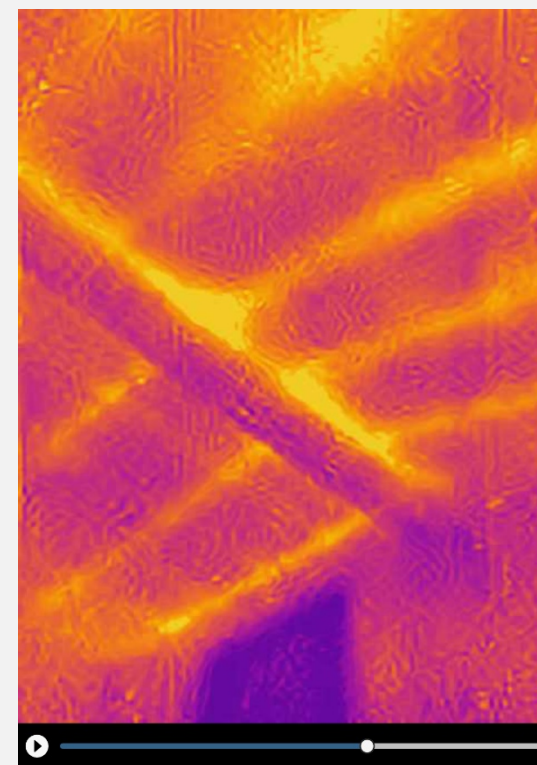
Out of school: observing thermal bridges. Students identify highly conductive and poorly insulated components within school buildings. Retrofitting such components with better insulation can reduce carbon footprints of buildings.

Telelab: A Cloud Platform for Connected Science Learning

Students use a thermal camera attached to a smartphone and our Infrared Explorer app to stream their observations and experiments in the real world to Telelab.
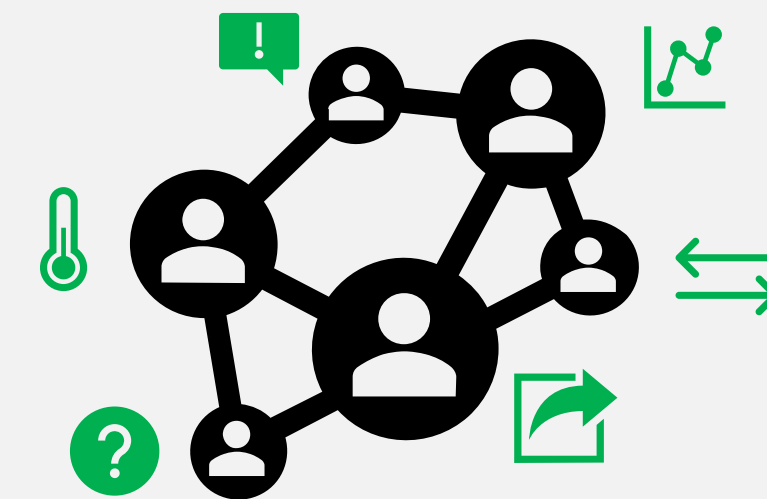
Anyone, including other students, can watch the livestream, explore the incoming temperature data, ask questions, add comments, and even perform and publish their own analyses on the shared datasets.
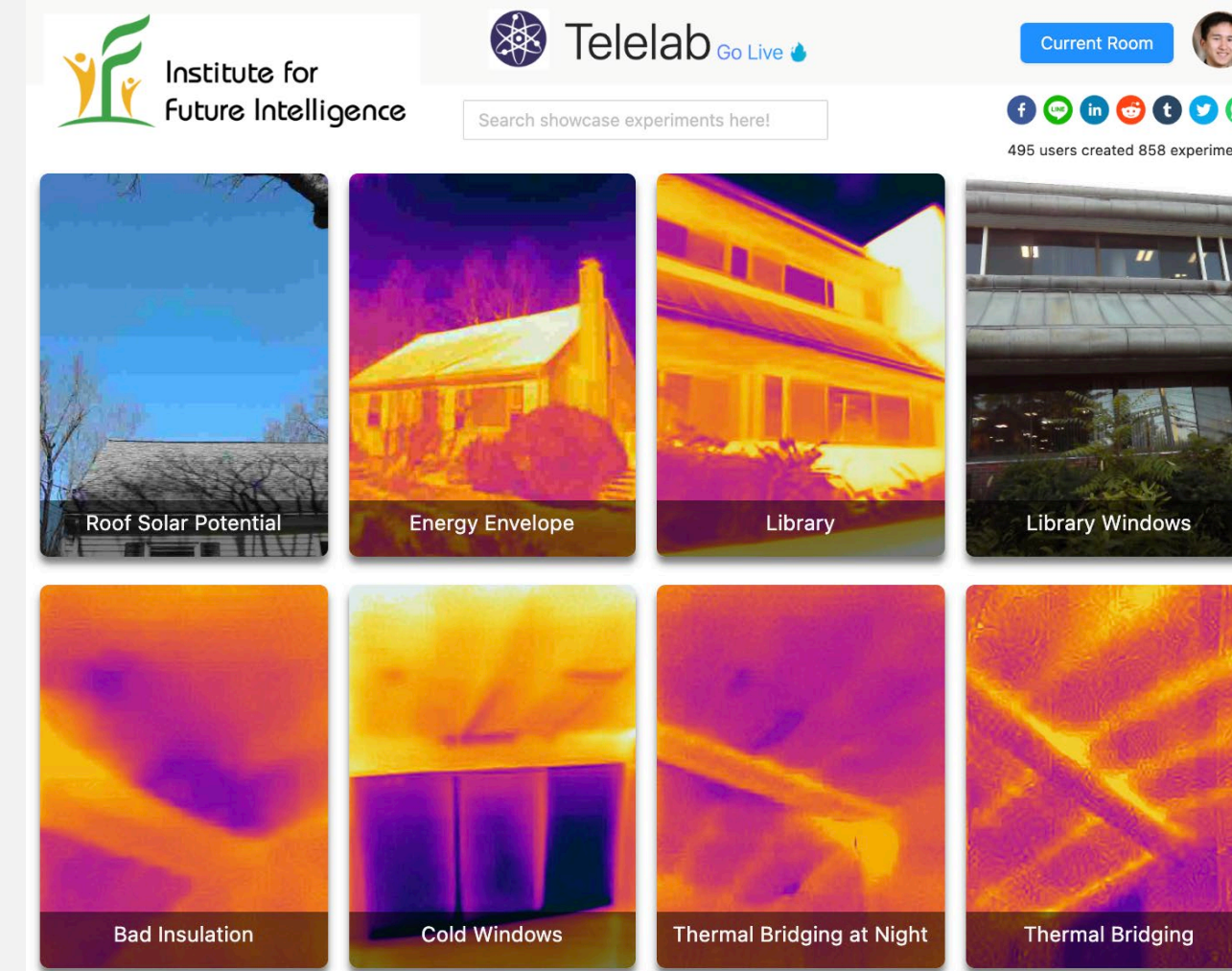
Student-generated IR imaging episodes of buildings on the Telelab portal. Powered by the IoT technology, Telelab provides a cyberinfrastructure of inquiry for an online community interested in certain topics such as energy efficiency or chemical reactions.
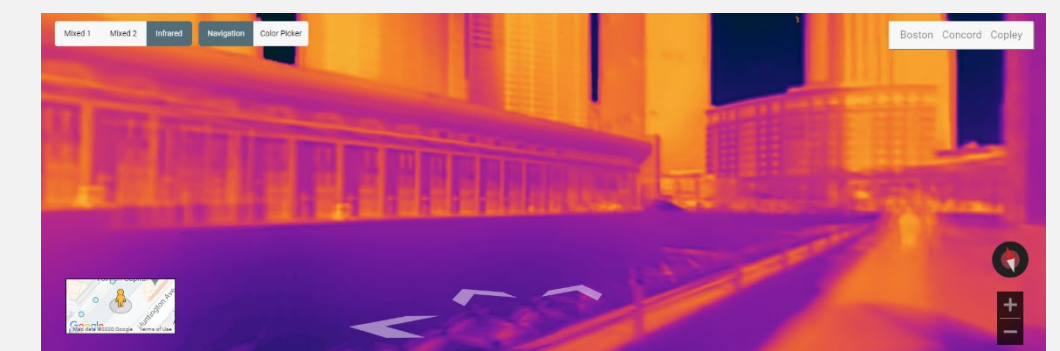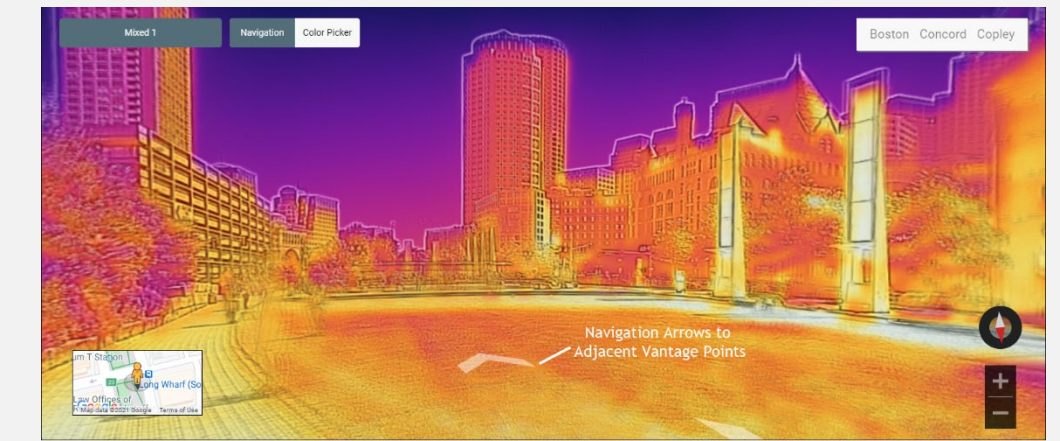
Telelab is designed to be a "TikTok" for citizen science

## Learning through Scientific Visualization and Data Analysis
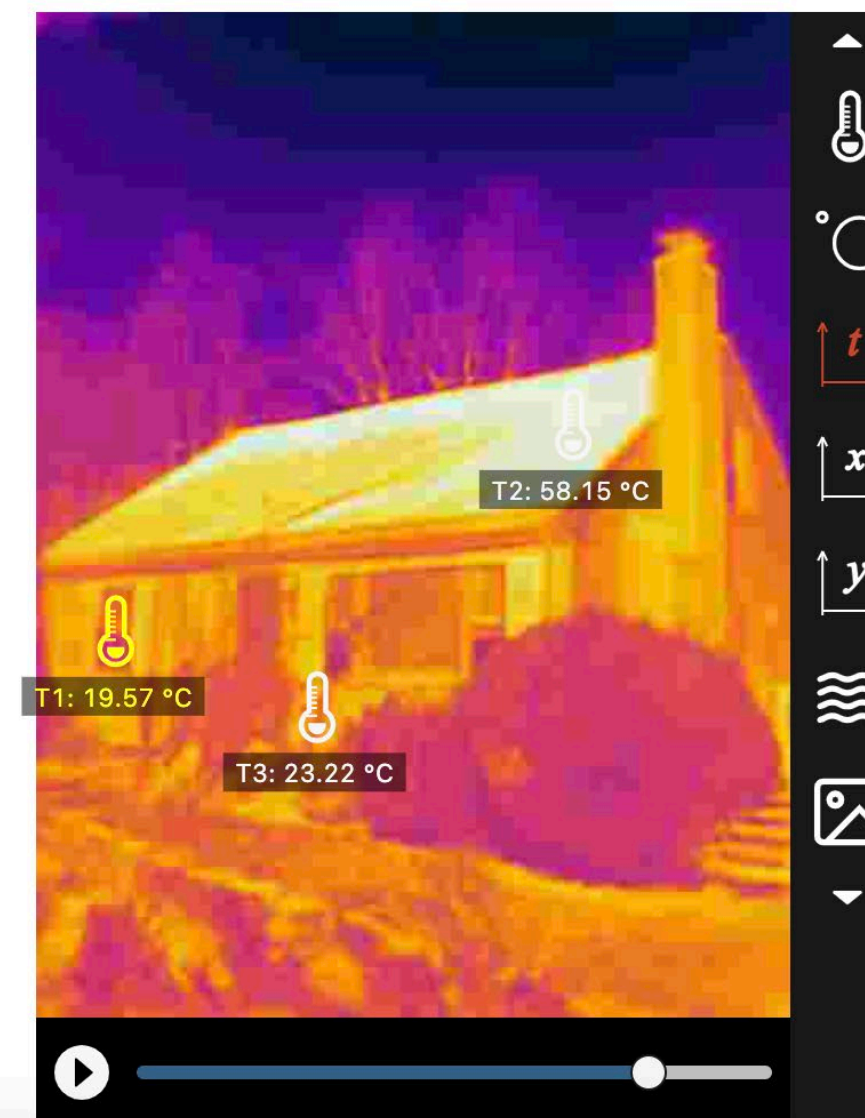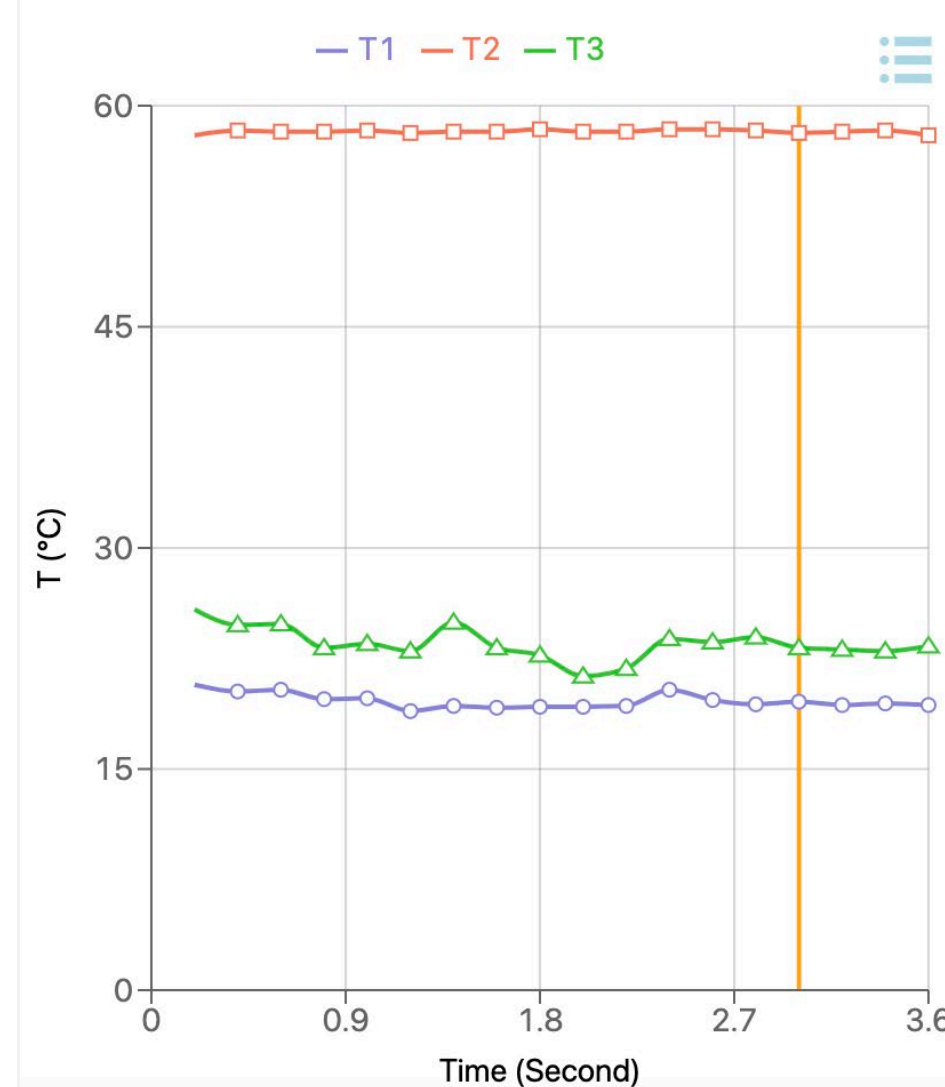
- Add thermometer
- Unit conversion
- Temperature vs. time
- Temperature vs. X-axis
- Temperature vs. Y-axis
- Isotherms
- Save a screenshot

Crowdsourcing Examples

Infrared Street View. A thermal equivalent of Google Street View that aims to promote awareness of the energy efficiency of the built environment through crowdsourcing by citizen scientists.
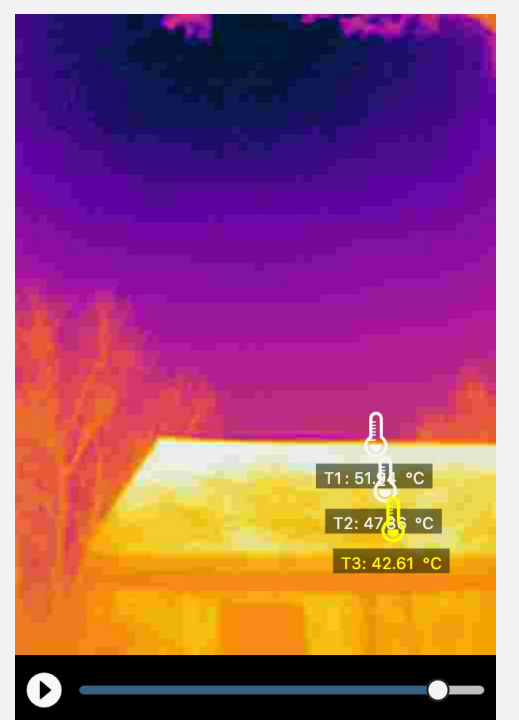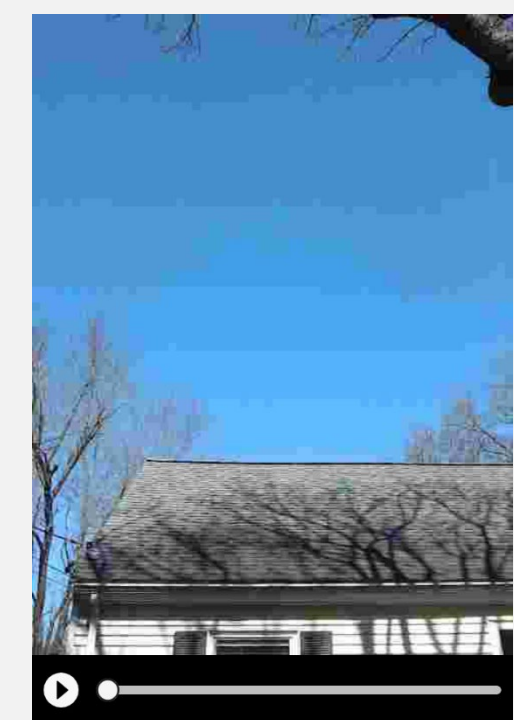
Solar potential survey. Higher solar irradiation increases energy output of solar panels if installed.

Home Page

https://intofuture.org/telelab.html