

# Joint ICTP-IAEA Workshop on Environmental Mapping:

Effective education and training for involving citizens  
in environmental monitoring

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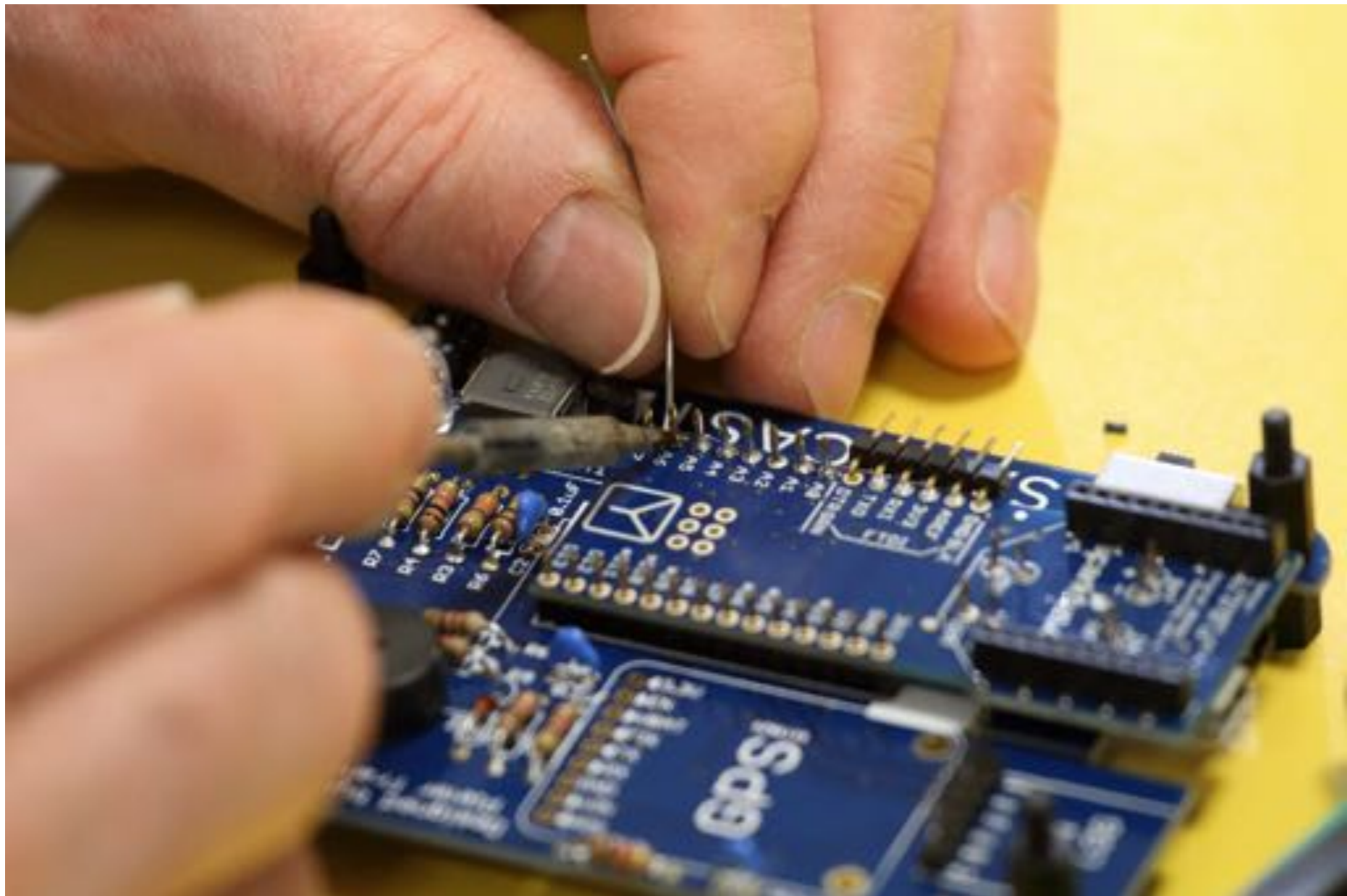
Workshop held at ICTP SciFabLab, Trieste  
March 6 - 24, 2017

Organized/sponsored by ICTP, IAEA, Safecast



# 29 nations represented

Mainly developing nations in Africa, Middle/ Near East,  
Central/South America, Carribean



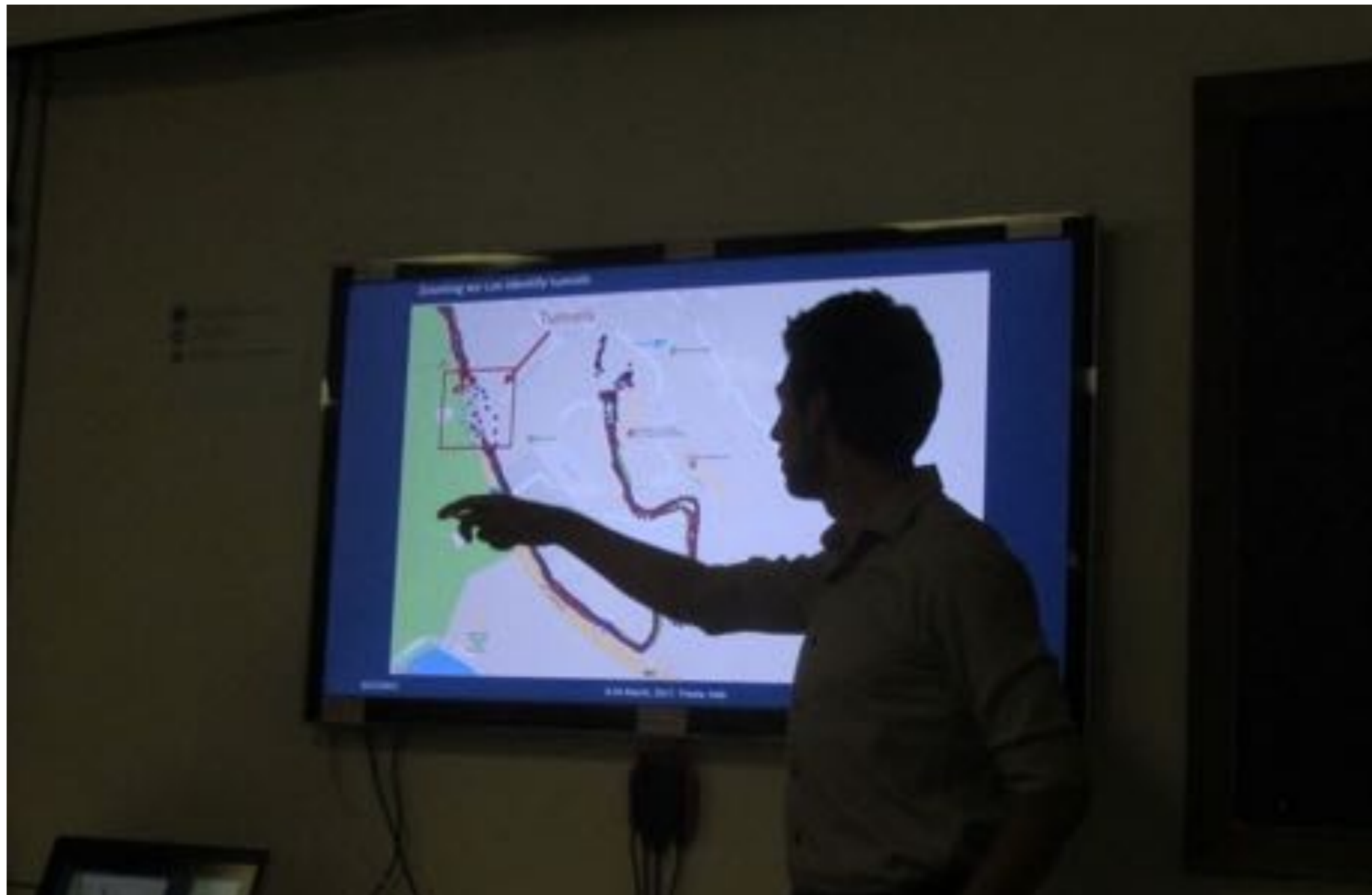
# Week One: Hardware/ data gathering

**Week one multi-day hands-on lab:** bGeigie Nano assembly, programming, and operation  
**90-minute lectures:** radiation detection and measurement; soldering technique and safety; Safecast project results; digital fabrication; open hardware; citizen-science based air-quality monitoring; citizen-science based air traffic and RF spectrum monitoring.



## Weekend field activity:

On weekends participants conducted self-directed data gathering in the field, using the bGeigie Nanos they had built. This data was used as the basis for GIS visualization and analysis. This activity provided strong team bonding among the diverse international participants.



# Week Two: Mapping/visualization and open-source tools

**Week two multi-day hands-on lab:** Internet-based GIS visualization tools

**90-minute lectures:** data visualization; big data; machine learning; open hardware design and fabrication; mobile data collection

**Presentations:** Team-based GIS analysis and visualization report



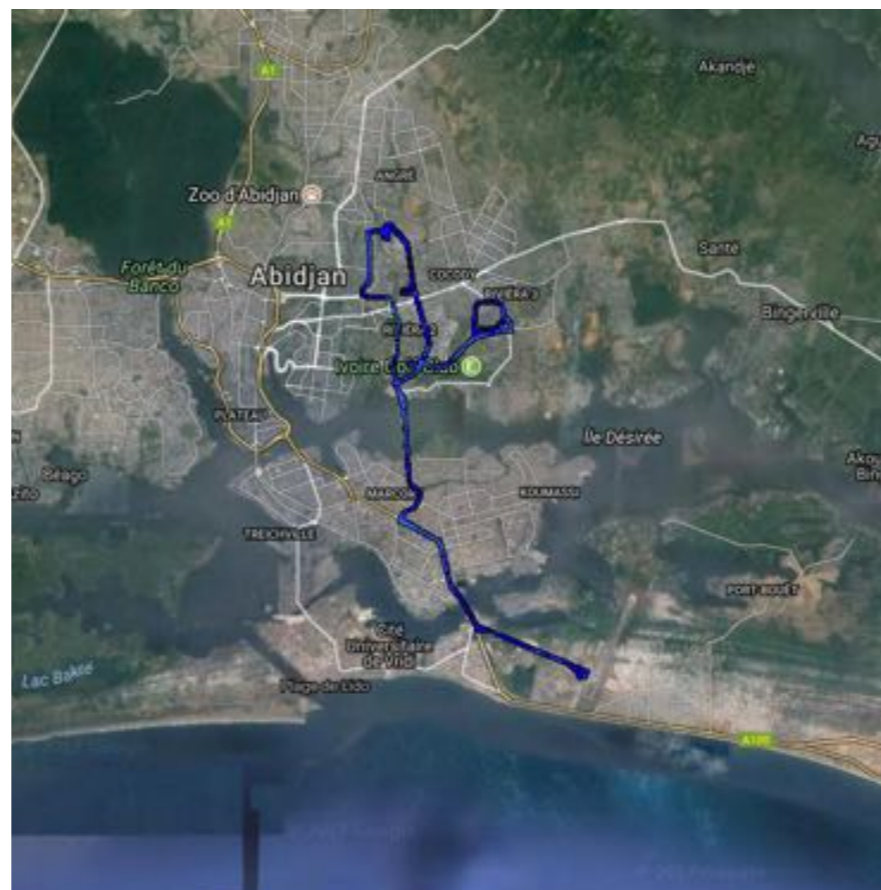
# Week Three: Science communication

**Week three half-day hands-on lab:** Using Google Tools for Science Communications

**90-minute lab:** Decision-making exercise

**90-minute lectures:** Risk Governance; Activities of Nuclear Transparency Watch; UN Sustainable Development Goals; Communicating science through the media; Physics Without Frontiers and the Atlas experiment; The Calflora Database; Stakeholder Engagement; Virtual archaeology.

**Summary activities:** Debate; Review; Closing; Awards and Certificate Presentations



## Results:

- Seeded citizen science activity for environmental sensing in developing countries.
- Professionals trained in the use of these tools and able to inform others
- Almost all participants began collecting and submitting data from their home countries.
- Group communication has continued through social media
- Interest in utilizing the bGeigie system in educational contexts
- African and Caribbean nation express interest in using the Safecast system for nationwide radiation surveys.





Final program and course material can be found here:

[http://wireless.ictp.it/citizenscience\\_2017/](http://wireless.ictp.it/citizenscience_2017/)

[safecast.org](http://safecast.org)