

# iEarth project "DIY værstasjoner for grensesprengende læring"

Harald Sodemann<sup>1</sup>, Ole Edvard Grov<sup>2</sup>, Hans Christian Steen-Larsen<sup>1</sup>  
<sup>1</sup>Geofysisk Institutt, <sup>2</sup>Skolelaboratoriet, Universitetet i Bergen

## Challenges:

- curriculum with lots of math
- semester without Institute contact
- learning limited to the classroom?
- hands-on experiences?
- show the fun of doing science

BSc klima, atmosfære og havfysikk

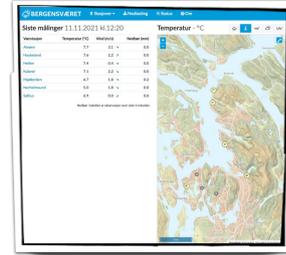
6. semester	GEOF200 Vegetasjon	GEOF211 Modellering	GEOF202 Feltkurs
5. semester	GEOF250/213 Vegetasjon	GEOF210 Distansanalyse	GEOF212 Klimasystem
4. semester	MAT131 Matematikk	GEOF110 Intro Dynamikk	ExpPhil
3. semester	MAT212 Matematikk	GEOF105 Termodynamikk	PHYS113/ KJEM110 Fysikk/Kemi
2. semester	MAT111 Matematikk	MAT121 Matematikk	PHYS111 Fysikk
1. semester	MAT110 Matematikk	GEOF100 Introduksjon	INF109 Programmering

## Starting point:

In 2017, 3 students delivered a BSc thesis, in collaboration with Høyskolen i Vestlandet (Ruben Austefjord, Simen Norrheim Larsen and Eirik Vivelid Stokke, DIY Værstasjon) as an open source project



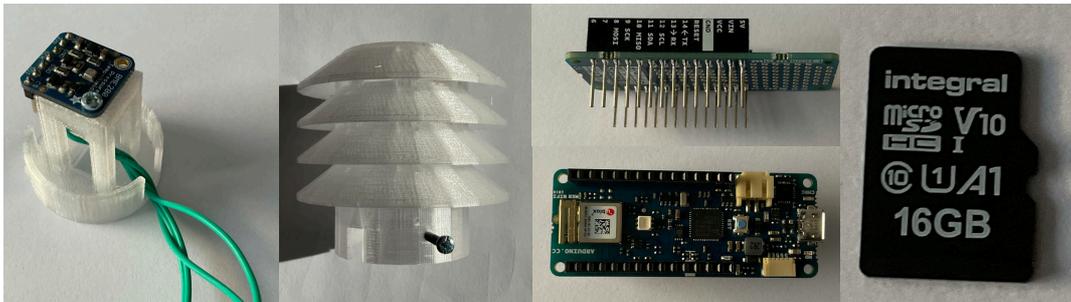
Skolelaboratoriet has experience in weather station networks with schools in and around Bergen <https://bergensveret.no>



## VISION

Students take the learning far beyond the ordinary boundaries of a classroom by soldering and 3D-printing their own little weather stations, that measure pressure, wind, temperature right where they live, deliver the data to an online database, and do math exercises with their own measurement data.

SD card shield



Bosch BME280 on Adafruit board. Measures temperature, relative humidity, air pressure (PTU). Solder 4 pins for serial communication and power from microcontroller.

Weather hut to protect sensor from rain while allowing air to pass through. Matching mount and support for sensor. 3D-printed from PETG

Microcontroller Arduino MKS1010

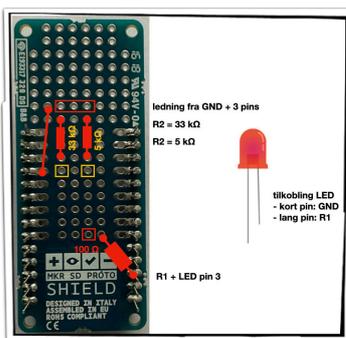
- control logic
- communication with sensor
- wifi communication

SD card used for

- intermediate storage of weather data
- configuration files
- log files from server communication

## PARTS

The components can be bought online for all together about 1000 kr. Suitable protection cap requires a 3D printer. The entire project is open source, and can be reproduced by anyone.



## Student activities:

- 3D printing
- learn about microcontrollers
- be social
- break the ice
- use own hands
- create
- putting things together
- learn about measurements
- learn about internet and network technology

## What's next

We scale the concept to the BSc program within GFI Co-Create. Main challenges are time constraints, configuration of the weather stations, and testing limitations due to network security.