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## infoBalloons: an Italian High School educational self-made budget friendly STEM experience with hot air/stratospheric balloons

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infoBalloons 2.0 is a selected Sounding Balloon (SB) Experiments in the 2nd HEMERA Call for Proposals (*HEMERA H2020. This project has received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No 730970*).

This is a solution (self-made app/software and budget friendly IoT sensors and TC/TM communication link) to collect and then analyze data regarding atmospheric sounding, flight info/data and LPWAN (Low Power Wide Area Network) performances during a stratospheric balloon flight. Optional also to take POV photos/video of the flight.

infoBalloons 2.0 is the natural evolution of infoBalloons. The old 1.0 system reports a bunch of environmental data to an Android self-made app (available on Google Play for free) being carried in the hot air balloons using budget friendly industrial IoT sensors called Blebricks. IoT sensors communicate with the Android app installed inside the pilote's smartphone using Bluetooth protocol and then the app partially elaborates the data and transmits them into the cloud (iSENSE platform) using a data (3G/4G) connection. infoBalloons was used several times during test flights and also for example during the International Hot Air Balloons Meeting in Mondovì in January 2019; it was developed by a group of Scientific High School students (I.I.S. "Cigna-Baruffi-Garelli" – Mondovì [Italy]) with the technical support of John Aimo Balloons - [Italy] (hot air balloons flights), Bleb Technology - [Italy] (Blebricks, the budget friendly industrial IoT sensors), iSENSE team (iSENSE is a web system for sharing and visualizing scientific data, based at the Engaging Computing Group at the University of Massachusetts Lowell [USA]) and MIT App Inventor team (CSAIL - Massachusetts Institute of Technology [USA]). The work was also presented in the Poster Session at last MIT App Inventor Summit 2019 in Cambridge, MA – USA.