

OCRA - OUTREACH COSMIC RAY ACTIVITIES AT INFN

IPPOG Global Cosmic Steering Group
GSI, May 23, 2019

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ISTITUTO NAZIONALE DI FISICA NUCLEARE - INFN



INFN is the Italian Institute that promotes, coordinates and carries out scientific research in the fields of subnuclear, nuclear and astroparticle physics. It promotes innovation via technology transfer and operates in strong connection with the universities and within international collaborations.

Around 2000 employees and 4000 associates (university employees, PhD students, post docs, etc.)



OCRA
Outreach Cosmic Ray Activities

OCRA – Outreach Cosmic Ray Activities was born in 2018 as a **national outreach project of INFN** with the aim of collecting within a national framework the numerous **public engagement activities in the field of cosmic ray physics** already present at a local level in the divisions and laboratories.

At the moment 17 local groups participate, 4 more are likely to join this year!

National coordinators: Carla Aramo (INFN Napoli), S.H. (INFN Padova)

<https://web.infn.it/OCRA/>





INTERNATIONAL COSMIC DAY 2018

All OCRA partners participate in the ICD

In 2018 3 divisions did not participate due to missing instrumentation, trying to resolve for 2019

ICD 2018 IN OCRA

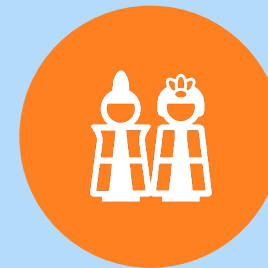
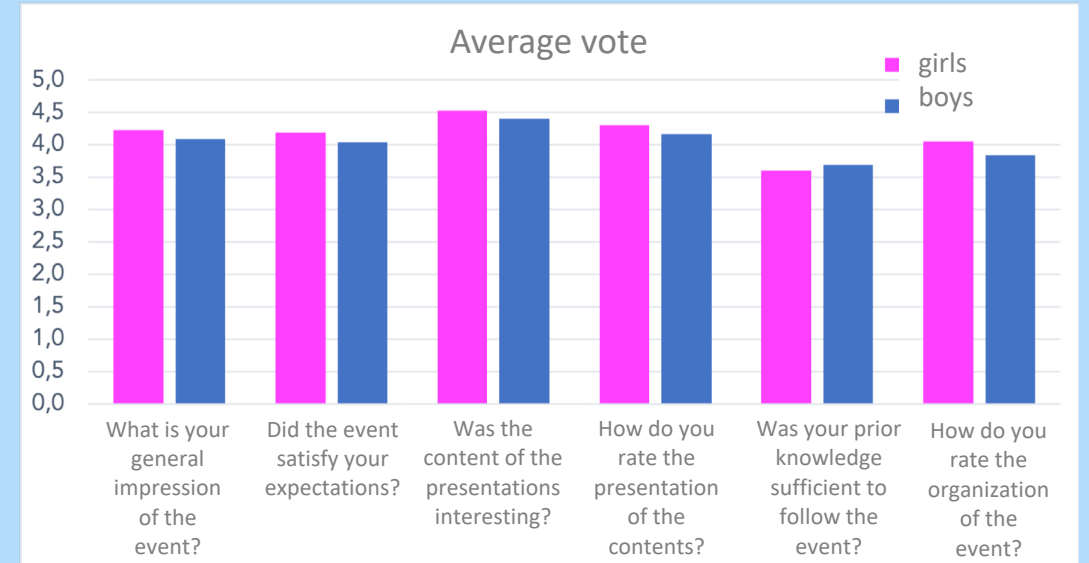


ALMOST 800 STUDENTS



BETWEEN 30 AND 100 STUDENTS AT EACH LOCAL EVENT

What was the part of the day you liked best?	Frequency
Theory/seminars	123
Experiment/data analysis	79
Skype conference	25



42% GIRLS



89 SCHOOLS FROM 66 TOWNS



WHO?

Two students per OCRA ICD participant selected based on competition (report on ICD experiences) and 5 teachers acting as chaperone

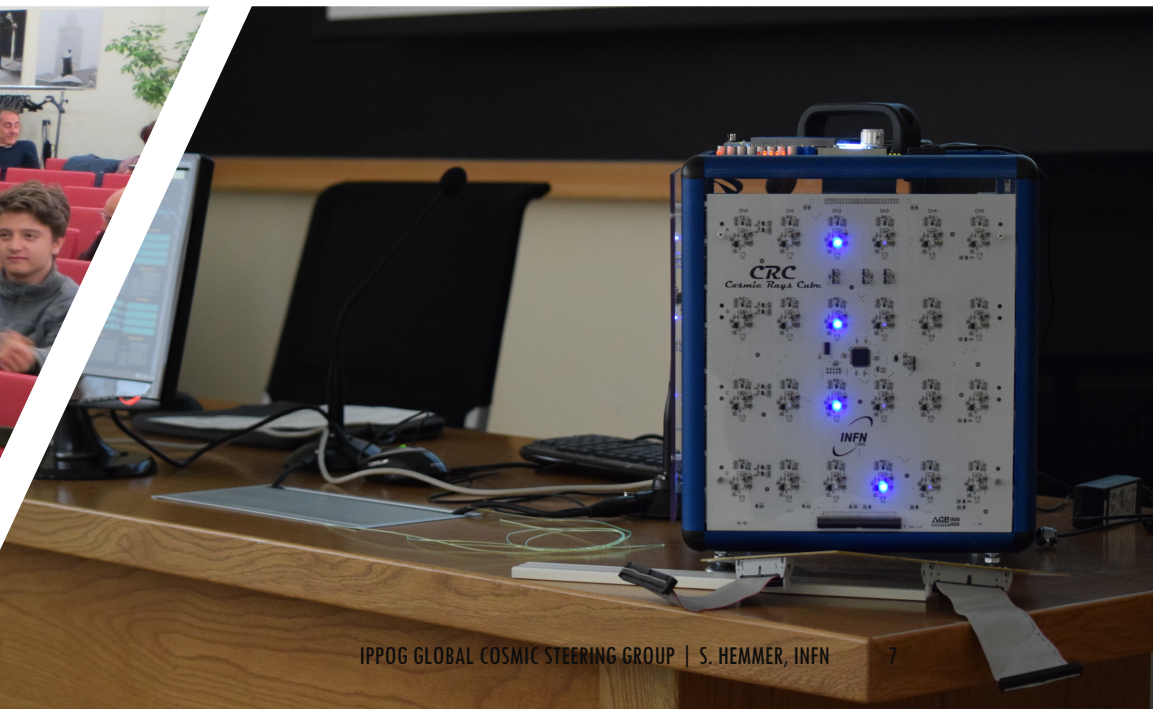


WHAT?

Measure the cosmic ray flux at different altitudes in the Gran Sasso area

3 DAY OCRA SCIENCE CAMP FOR STUDENTS

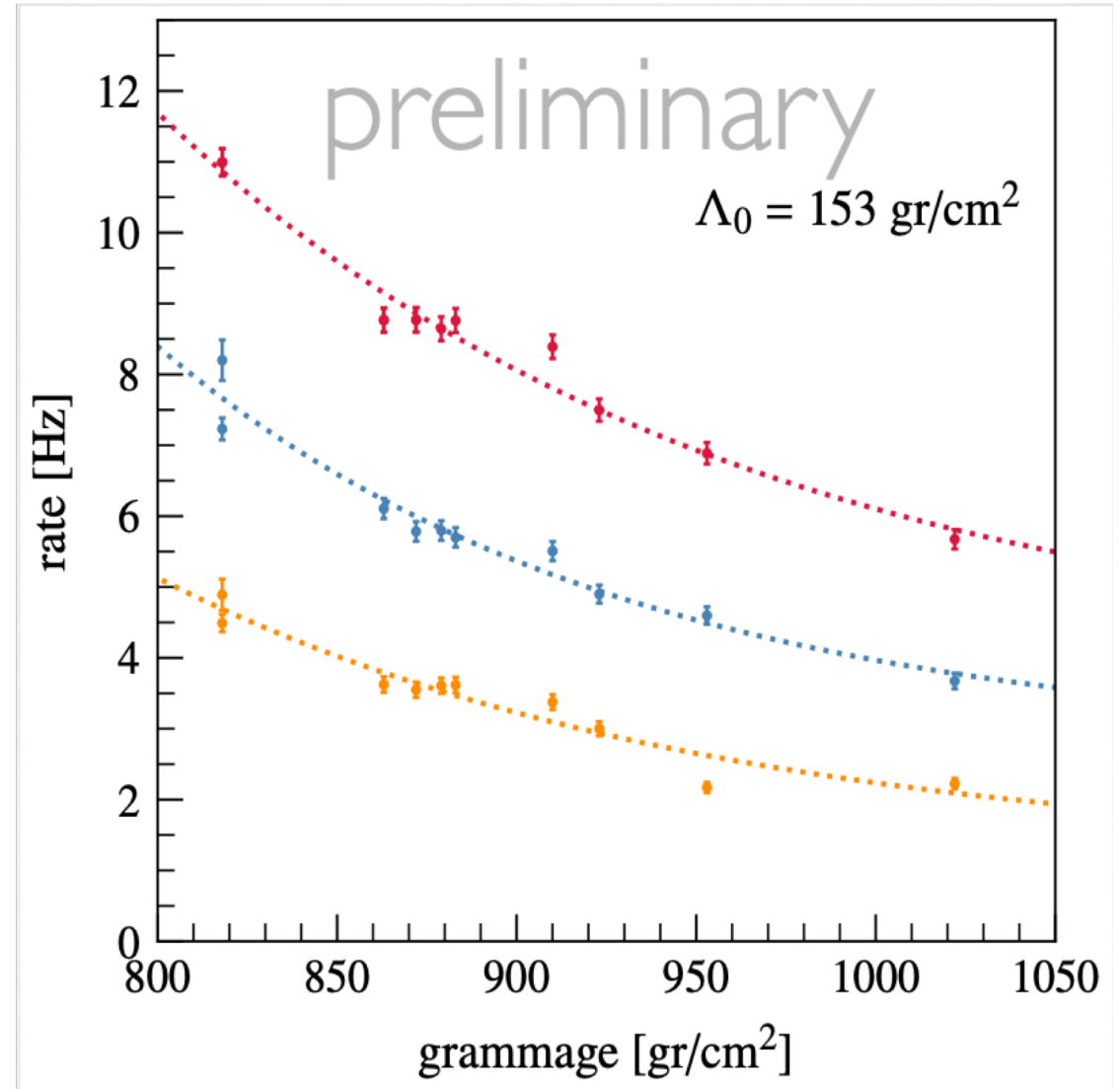
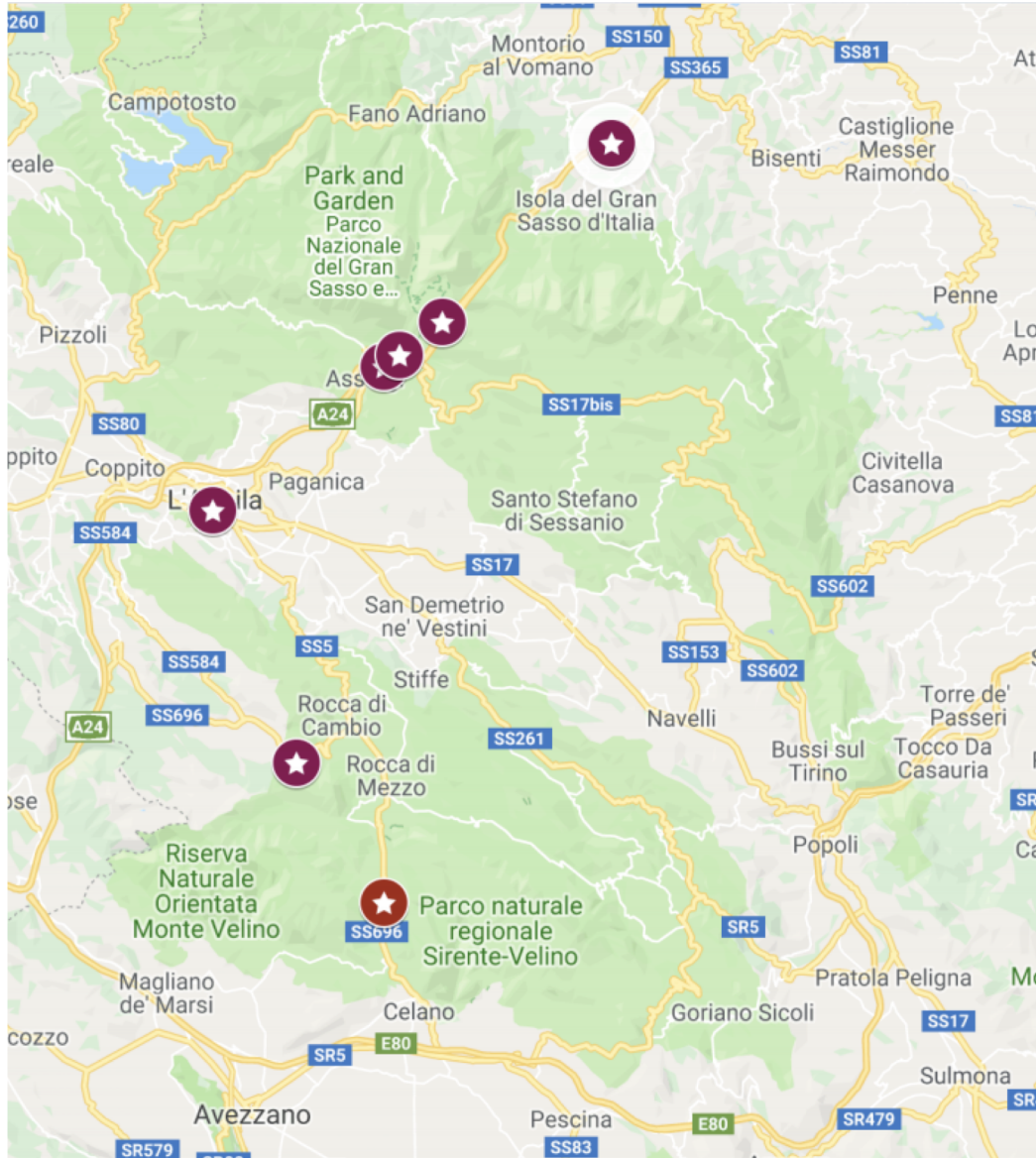
14 – 17 APRIL 2019





23/5/19





Teacher training

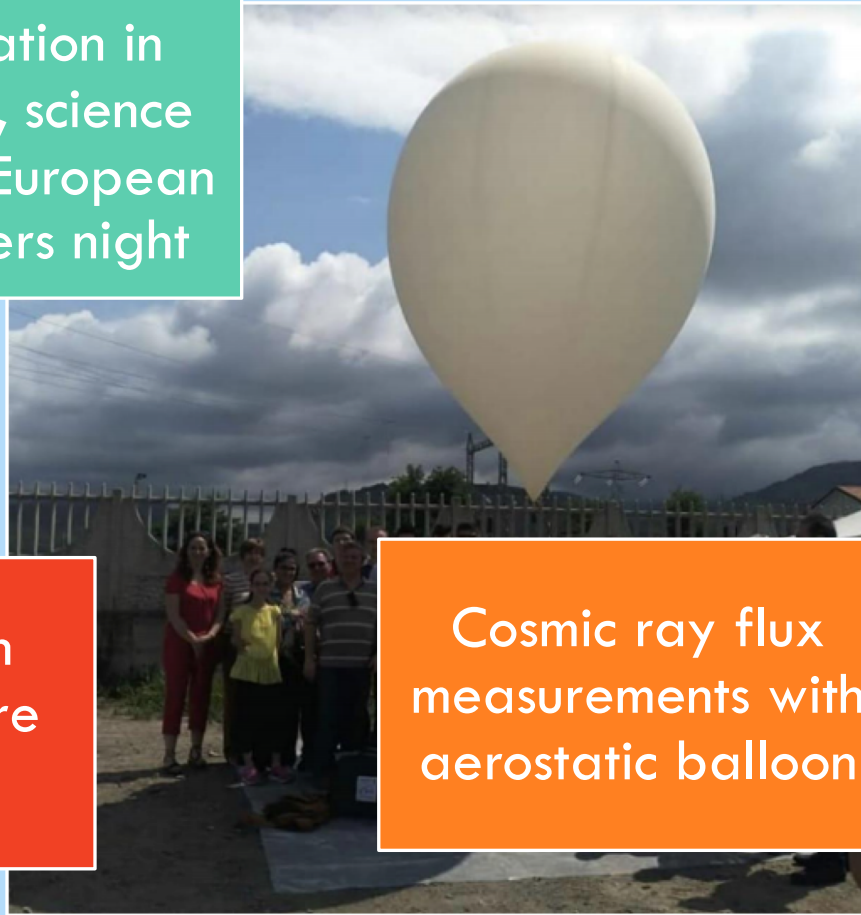


Internships and trainings for students

Participation in book fair, science fairs and European researchers night



Masterclass on Fermi and Pierre Auger



Cosmic ray flux measurements with aerostatic balloon

LOCAL ACTIVITIES



COSMIC RAY CUBE

We would like to build more of the cosmic ray telescopes used for the science camp, but also in many other activities, also in collaboration with students

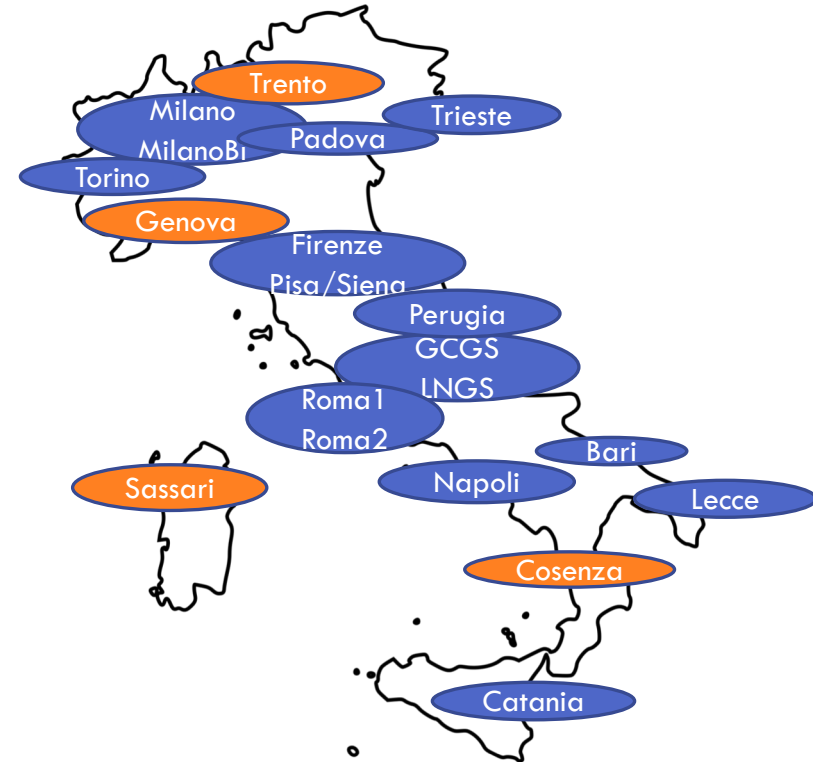
Problem: difficult to produce single telescope as scintillator not purchasable in small amounts

OCRA AS A FRAMEWORK TO COLLECT COSMIC RAY OUTREACH ACTIVITIES IN INFN

National level: ICD and science camp



Local level: many individual activities



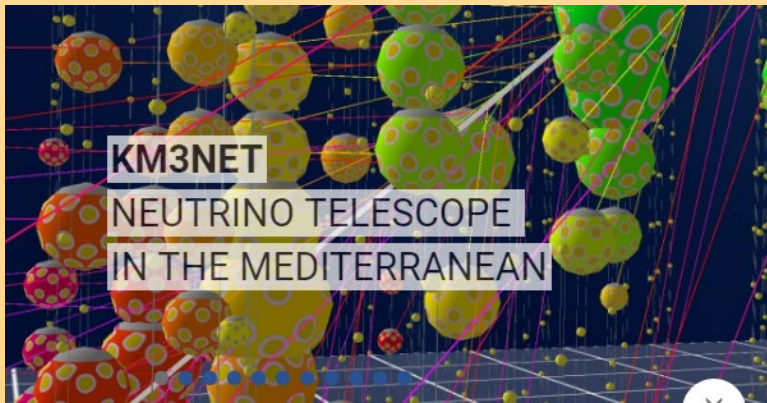
We have just gotten started and much more can be expected in the next years!

Considerazioni su possibili collaborazioni EEE - OCRA

- 0107-2019 **Sabine Hemmer** "un'attività che hanno in comune tutte le 22 sedi INFN partecipanti al progetto è la partecipazione all'International Cosmic Day. Siccome in alcune di queste sedi, in particolare a **Bari, Torino e Catania**, anche EEE partecipa all'ICD con un evento presso l'Università ci piacerebbe confrontarci con voi per decidere insieme come meglio organizzarci in queste sedi per evitare sovrapposizione. Pensiamo che la soluzione migliore sarebbe di **organizzare insieme la giornata, dando la giusta visibilità sia a OCRA e l'INFN, sia a EEE, e definendo un programma condiviso, eventualmente con qualche momento in comune e qualche momento in cui gli studenti verranno divisi per progetto se necessario**, per assicurare che tutti gli studenti possano seguire senza problemi le attività e usufruire al massimo della giornata. "
- NB: in EEE abbiamo un problema di ripetitività , considerando che alcuni gruppi hanno persone anche del terzo anno. Possibile differenziare ?

Considerazioni su possibili collaborazioni EEE - OCRA

- INFN è responsabile di K3MNET e tre Optical Modules sono operativi (2 in ORCA ed uno in ARCA)



- Proporre una collaborazione in cui loro gestiscono gruppi di studenti per studio ed analisi K3MNET, noi individuiamo alcune scuole per i dati EEE e poi i due gruppi si parlano, si scambiano informazioni e inseriamo nelle prossime Giornate una presentazione sul lavoro svolto.