



Improving environmental sustainability in science

- a yHEP initiative -

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Environmental sustainability in science

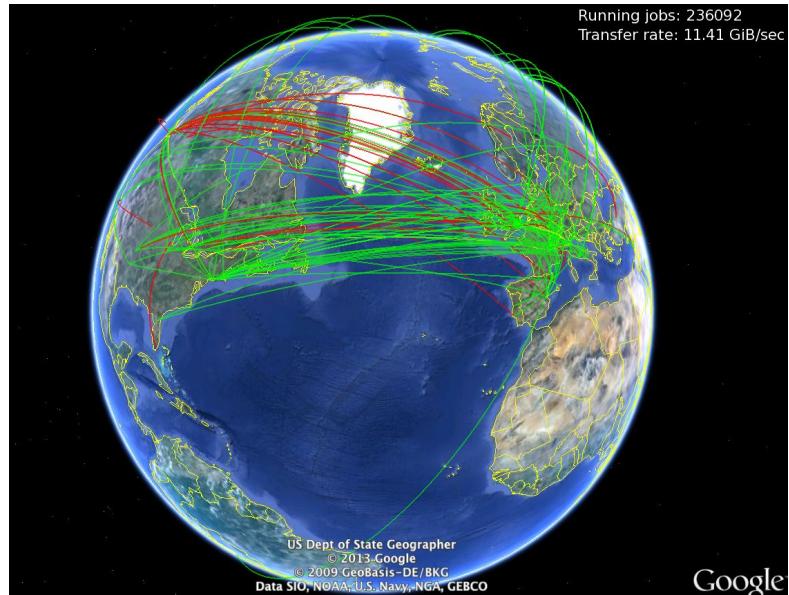


Science = most objective way to learn about nature: from particles to the universe

- Driver for change and innovation
- Foundation of any science = our planet
 - Homebase of scientists and experiments

How to make future science possible?

- Environmental sustainable
 - Innovative in the way we do research
- Scientists: uniquely qualified to judge outcome of climate research
- Lead by example by taking this seriously
- Science as driver of change in society

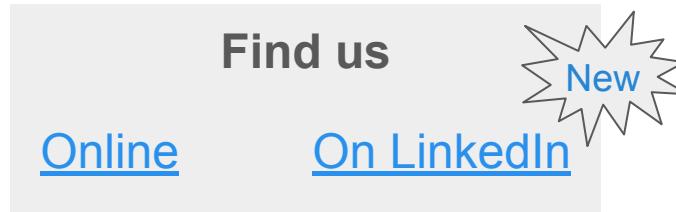


The young High Energy Physicist Association



Representation of early-career researchers in and related to Germany

- PhD students, postdocs, junior research group leaders = everyone w/o permanent contract
- Member in the German committees for particle physics (KET), astro-particle physics (KAT) and hadron and nuclear physics (KHuK)
 - Extension to committee for accelerator physics (KfB) intended
- Two representatives per section elected once a year
- Founded in 2015, currently about 300 members
 - To become a member, sign-up with your institute e-mail to our [mailing list](#)



Improving environmental sustainability in science



yHEP initiative: How to improve environmental sustainability in the way we do our research? → What could be done?

- Improvements of environmental sustainability affecting our daily work as researchers
 - Including improvements in the context of universities and research centers
 - Excluding statements on state or global policies, like nuclear power, etc.
- Ideas and proposals collected within yHEP community
 - Summarized & published Dec 2020 on our webpage: [yHEP recommendations](#)
 - Large part of recommendations are related to pre-Covid19 situation → Relevant for restart after current pandemic situation
 - Shape our “new post-Covid19 normal”

yHEP recommendations on improvement of environmental sustainability in science



Introduction

An increasingly important aspect of working and living conditions in current times is environmental sustainability, both concerning us as scientists as well as the planet as the basis on which we perform our research.

Being at the forefront of knowledge and innovation, as we all are in yHEP¹, we take our responsibility as drivers of change and innovation seriously – not only via the scientific research we conduct, but also for the way we perform the research. Future research should be excellent and reflect the responsibility for our planet at the same time.

This document describes the ideas and proposals of the yHEP community on improved environmental sustainability in our research. Ideas and proposals are sorted into several categories ranging from travel to environmental-awareness training and are discussed in the separate sections in detail.

Sustainability recommendations from yHEP



yHEP recommendations grouped in categories

- In approximate order of priority
 - Travel compensation / Green travel
 - Reduced travelling
 - Teleconferences
 - Conference organisation
 - Canteens
 - Computing and buildings
 - Purchases, funds and resource management
 - Environmental awareness training

Some numbers for perspective

Item	Climate impact
Remaining global carbon budget for 1.5°C increase (IPCC, C1.3)	~600 GtCO ₂
Global CO ₂ emissions in 2020 (Global Carbon Project)	40.1 GtCO ₂
CERN emissions 2017-2018 (Environmental report)	224 ktCO ₂ e
Possible reduction with train travel (5 trips of 800km one way by train instead of plane) (klima-fit-challenge)	1.4 tCO ₂ e / researcher 2.4 ktCO ₂ e for approx. 3000 scientists in KET, KAT, KHuK communities
German average / year (Umweltbundesamt)	11.7 tCO ₂ e / person

Summary

Future of science = environmentally sustainable

- yHEP = Representation for early-career researchers in and related to Germany
- Collected recommendations for improved environmental sustainability in daily work of scientists and at research centers/universities
- Example: Reduction of CO2 emissions with train travel instead of plane
 - ~10% of German citizen average
 - ~1% of CERN's budget for members in KET, KAT and KHuK together



What to do next?

- Gather additional points from feedback
 - Green energy generation
 - Investments in green research & development
- Collection of environmental reports