Internationale Astronomie im Blickfeld der Flugreduktion

Knud Jahnke
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Max-Planck-Institut für Astronomie

Forschungsinstitut in Heidelberg

~300 Mitarbeiter*innen: Astrophysik, Instrumentierung

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Teil der Max-Planck-Gesellschaft: 84 Institute, 21.000 Mitarbeiter*innen

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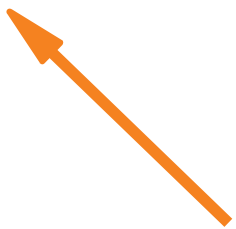
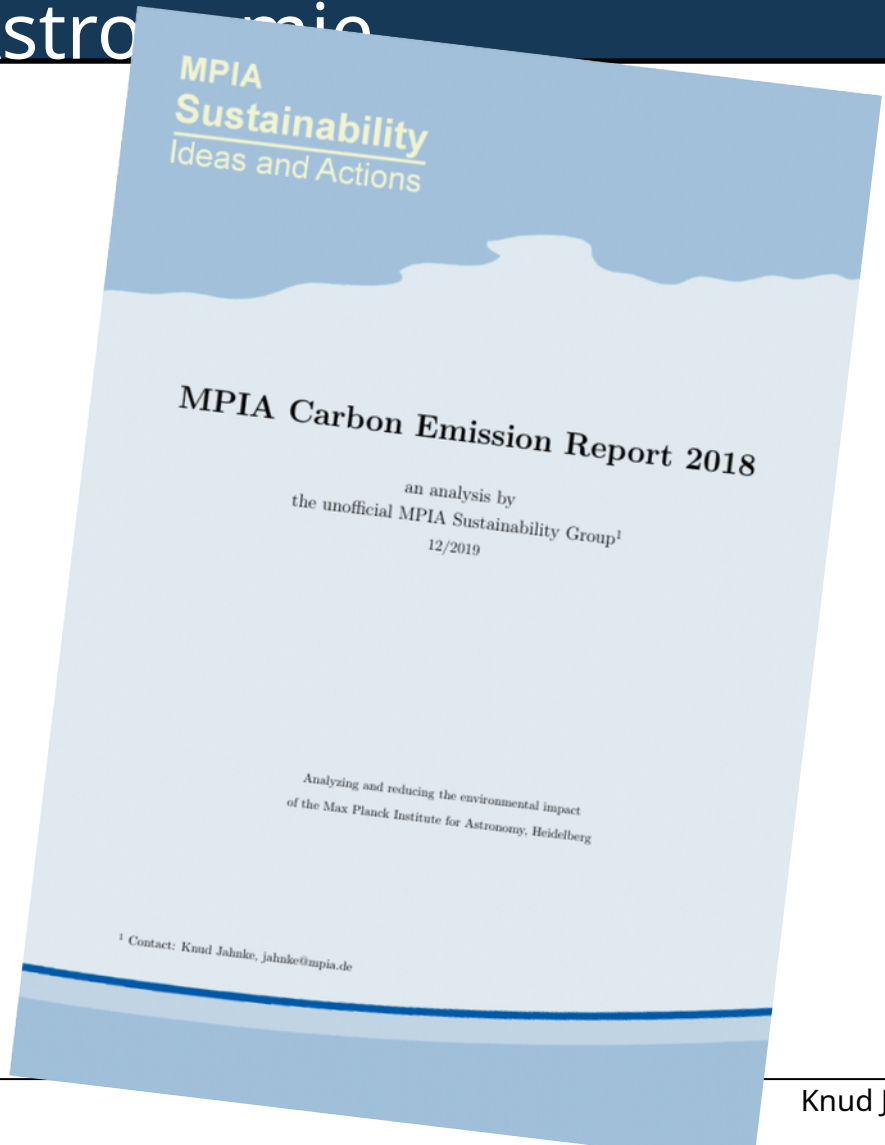


Rahmen:
MPG-Klimaaktionsplan
V1, Februar 2024

Emissions-Assessment 2018



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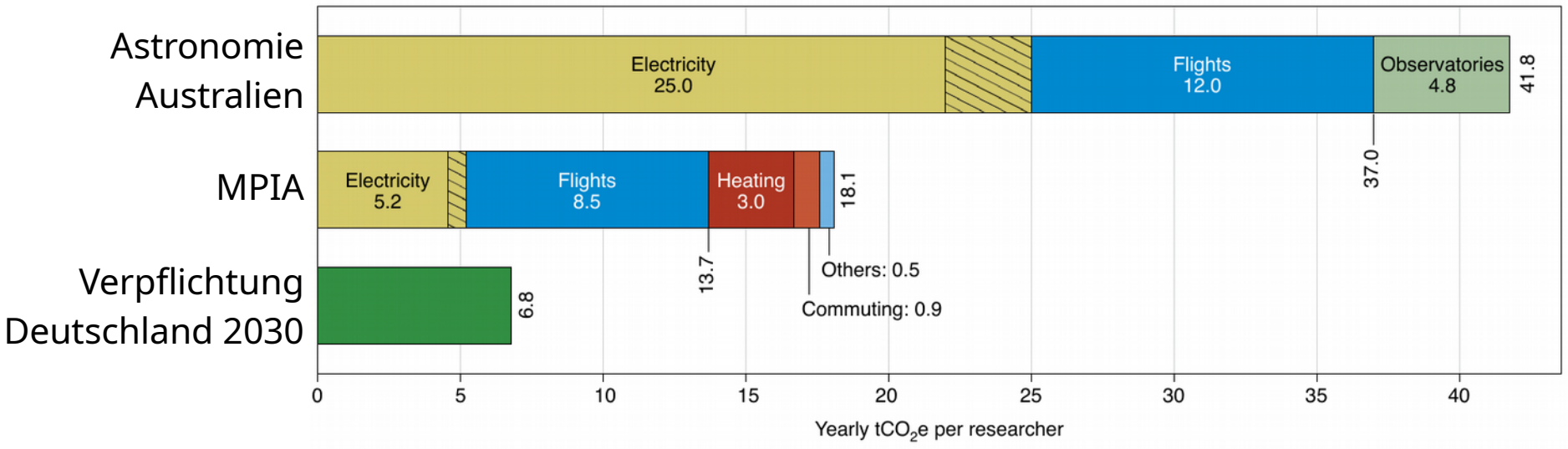

(Jahnke et al. 2020, Nature Astronomy, 4, 812)

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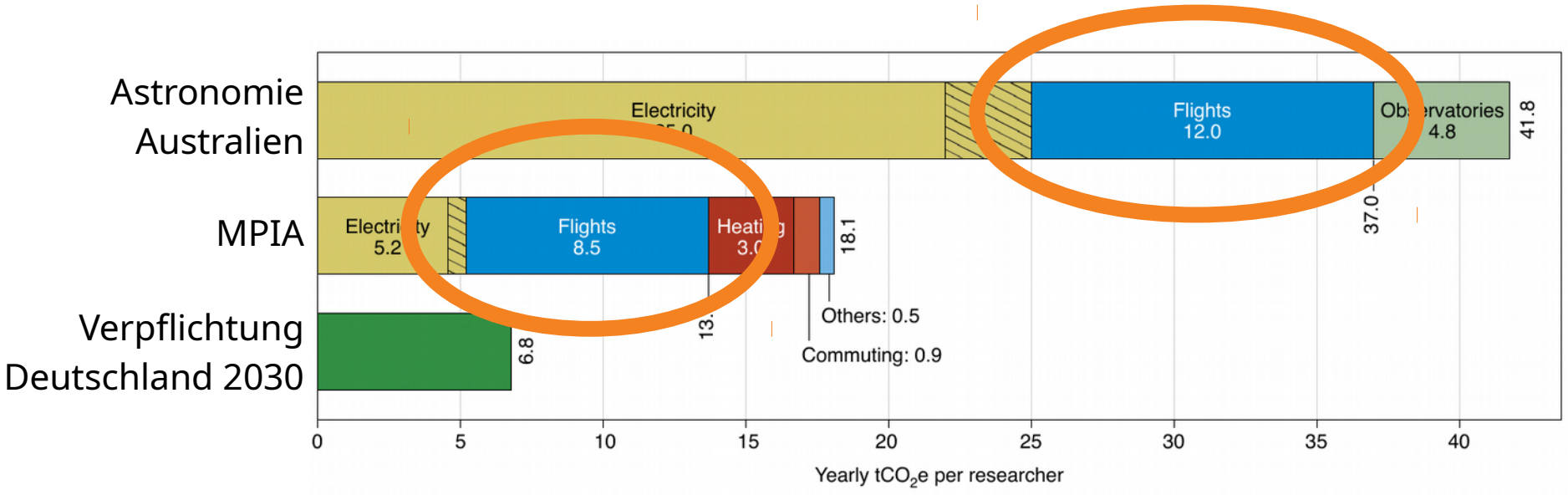

(Jahnke et al. 2020, Nature Astronomy, 4, 812)

→ Flüge erheblicher Teil der Instituts-Emissionen

→ Anlässe:

- “Feldforschung” (Beobachtungsreisen, Montagen)
- Konferenzen/Workshops
- Forschungsaufenthalte, Gremien

Astronomie

- Sehr international: 7 Kontinente
- Teleskope: Südamerika, entfernte Inseln
- Viele multi-nationale Projekte

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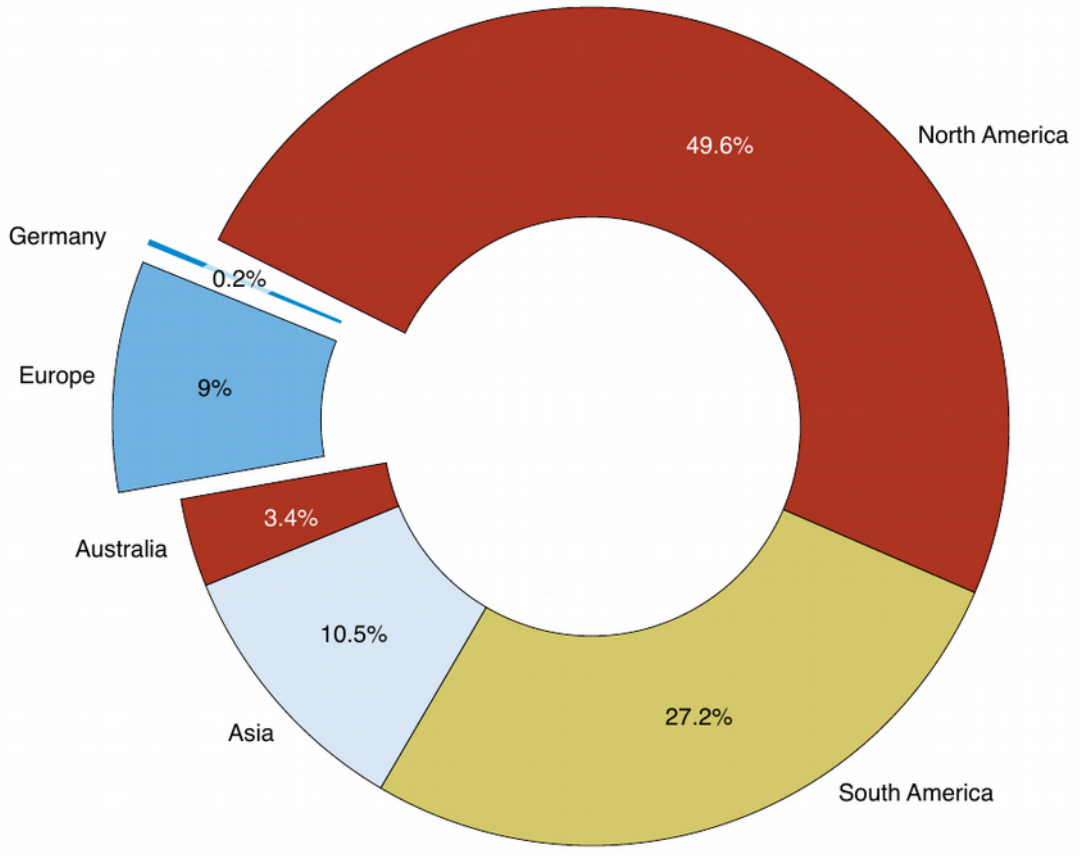

(MPIA: Jahnke et al. 2020, Nature Astronomy, 4, 812)

Astronomie

→ Frage: “Gesamt-Flugemissionen Astronomie 2019?”

→ “Einfach: Konferenzen” → …2021…2022…2023…2024…

Astronomie

- 362 Konferenzen/Schulen

  → *alle* weltweit

PNAS nexus

PNAS Nexus, 2024, 3, pgae143
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Research Report

Astronomy's climate emissions: Global travel to scientific meetings in 2019

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Edited By: Jiahua Zhang

Abstract

Travel to academic conferences—where international flights are the norm—is responsible for a sizeable fraction of the greenhouse gas (GHG) emissions associated with academic work. In order to provide a benchmark for comparison with other fields, as well as for future reduction strategies and assessments, we estimate the CO_2-equivalent emissions for conference travel in the field of astronomy for the prepandemic year 2019. The GHG emission of the international astronomical community's 362 conferences and schools in 2019 amounted to 42,500 tCO_2e, assuming a radiative-forcing index factor of 1.95 for air travel. This equates to an average of 1.0 ± 0.6 tCO_2e per participant per meeting. The total travel distance adds up to roughly 1.5 Astronomical Units, that is, 1.5 times the distance between the Earth and the Sun. We present scenarios for the reduction of this value, for instance with virtual conferencing or hub models, while still prioritizing the benefits conferences bring to the scientific community.

Keywords: conferences and meetings, climate-change impacts, climate-change mitigation, astronomy and astrophysics

Significance Statement

The climate crisis is the biggest challenge of our lifetime, and systemic changes are needed to reduce greenhouse gas emissions. Professional travel, especially international flights, accounts for a significant portion of the carbon footprint of academia. In our study, we take a look at air travel from scientific astronomy meetings, held in the prepandemic year 2019, to obtain quantitative information from the international astronomical community that can be used to set realistic targets for the necessary emission reduction. We explore alternative scenarios for meetings, which lower the amount of air travel, and thereby the carbon footprint of the scientific community, but still include or even increase the benefit of meetings for international collaboration.

Introduction

There is unequivocal scientific evidence that the current climate change on Earth is caused by the emission of anthropogenic greenhouse gases (GHGs), dominated by CO_2 and CH_4 (1). Global warming leads to an increase in the frequency and severity of extreme weather events including droughts, flooding, and (large) wildfires—and adds extreme costs and health risks to humans (2). In order to limit the effects of the accelerating climate crisis

Competing Interest: The authors declare no competing interest.
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(Gokus, Jahnke, Woods et al. 2024, PNAS Nexus, 3, 143)

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- 362 Konferenzen/Schulen

  → *alle* weltweit

- 1,1 tCO2e /Person /Konferenz

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Astronomie

- 362 Konferenzen/Schulen

  → *alle* weltweit

- 1,1 tCO2e /Person /Konferenz
- 42.500 tCO2e gesamt (RFI=1,95)

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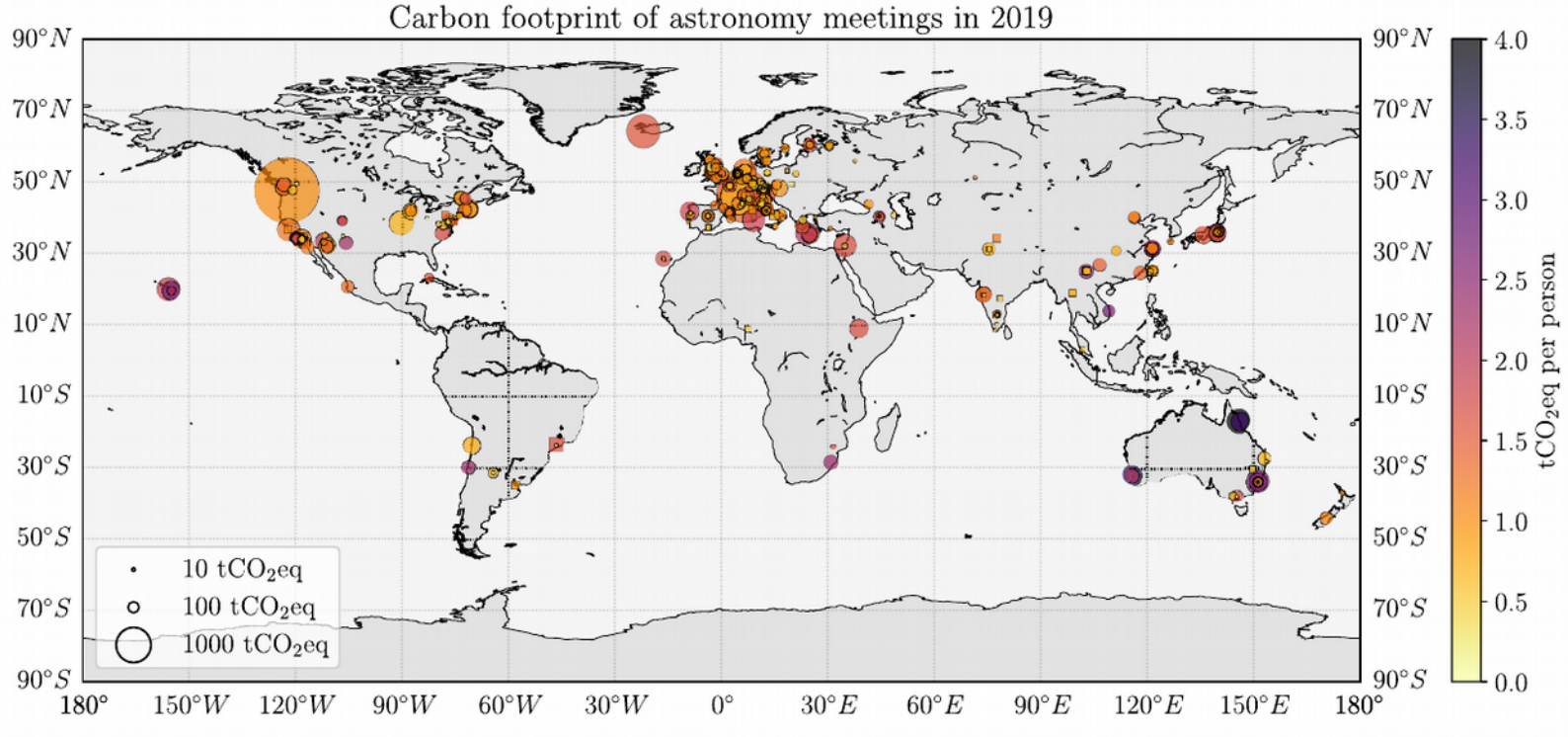
Konferenzorte Astronomie vs. Emissionen



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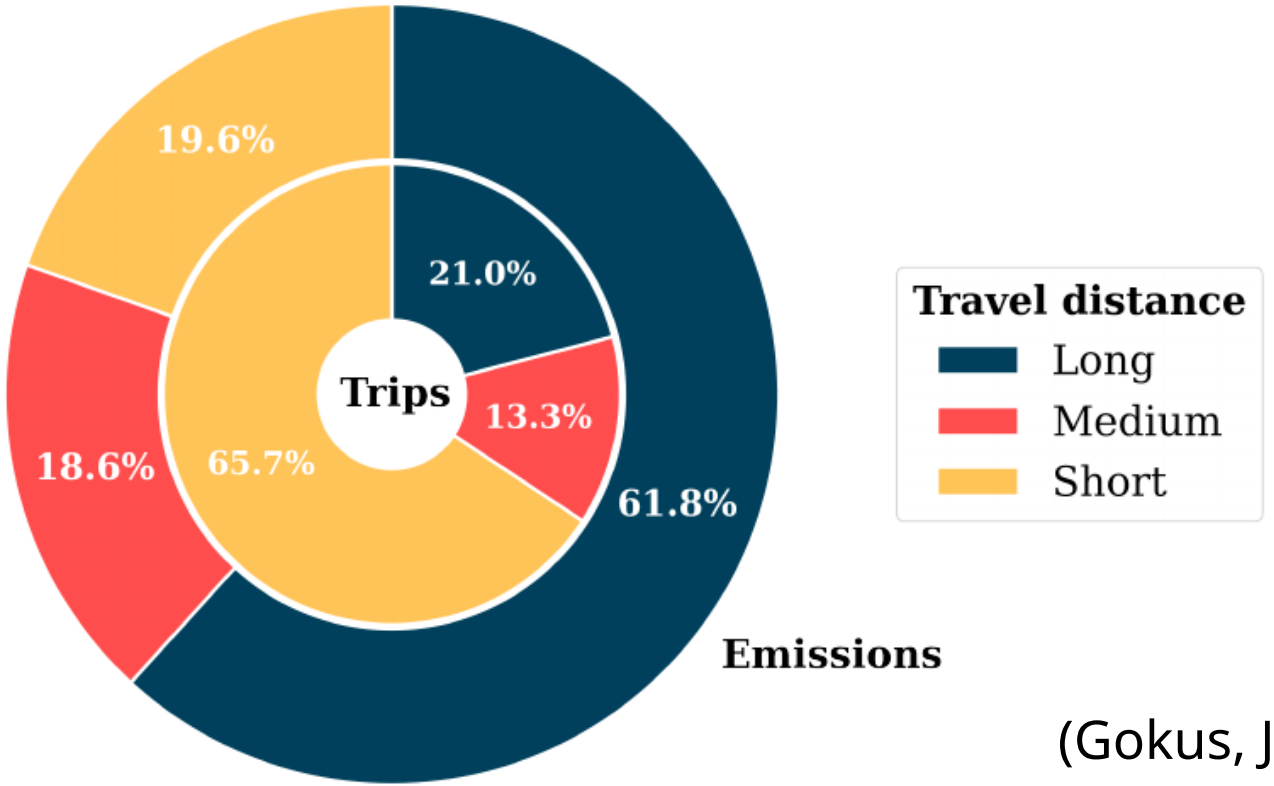
Anteil Emissionen nach Entfernung



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Astronomie

Lösungen:

- Weniger Meetings, länger
- Lokaler; ‘Hubs’ (z.B. 3 Orte auf 3 Kontinenten, vernetzt)
- Bessere virtuelle Meetings

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- Bessere virtuelle Meetings

Benötigt:

- “Community-Lösung”, weltweit
- Andere Meeting-Strukturen; bessere virtuelle Technik

~Ende~