

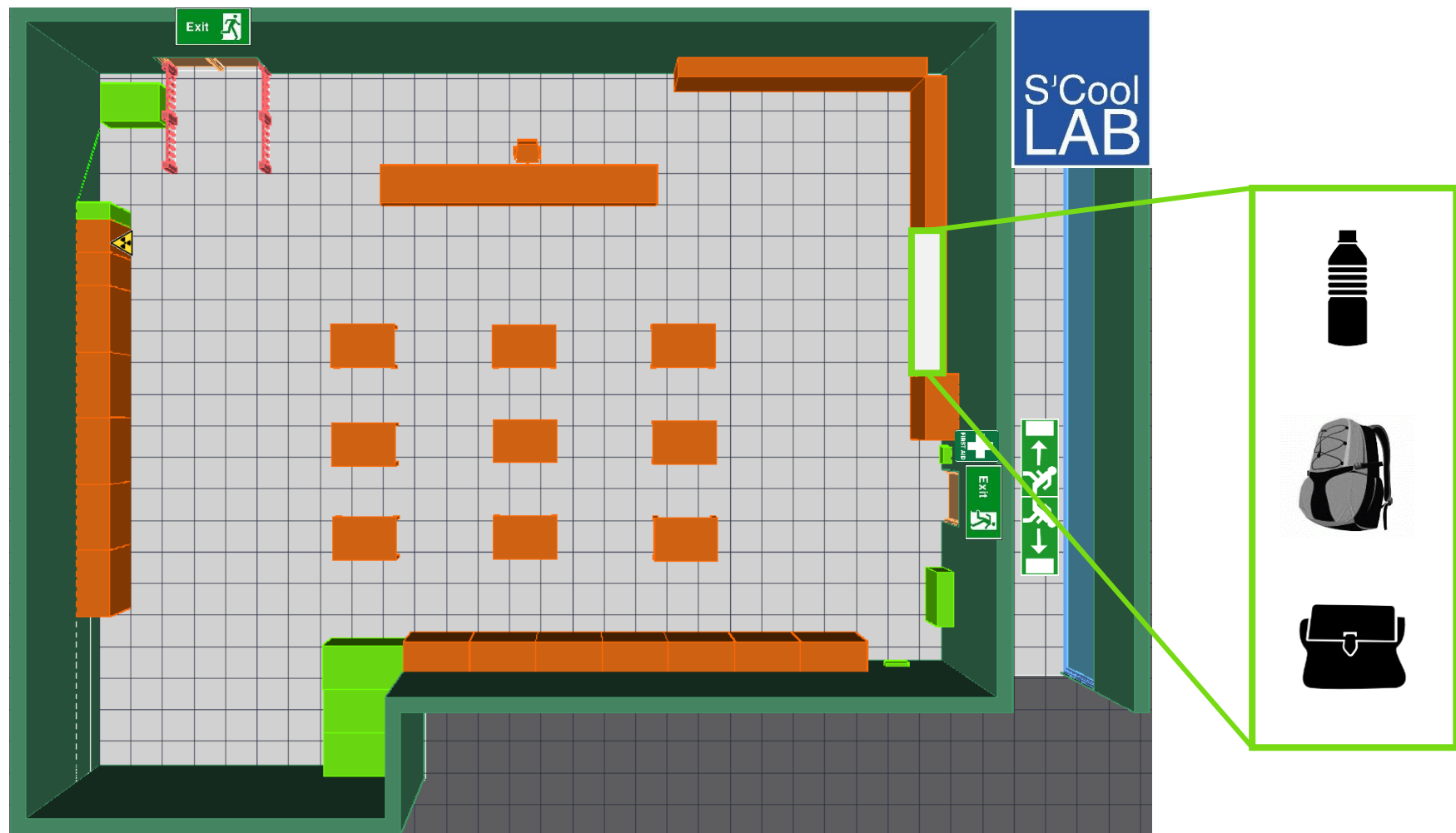


S'Cool  
LAB

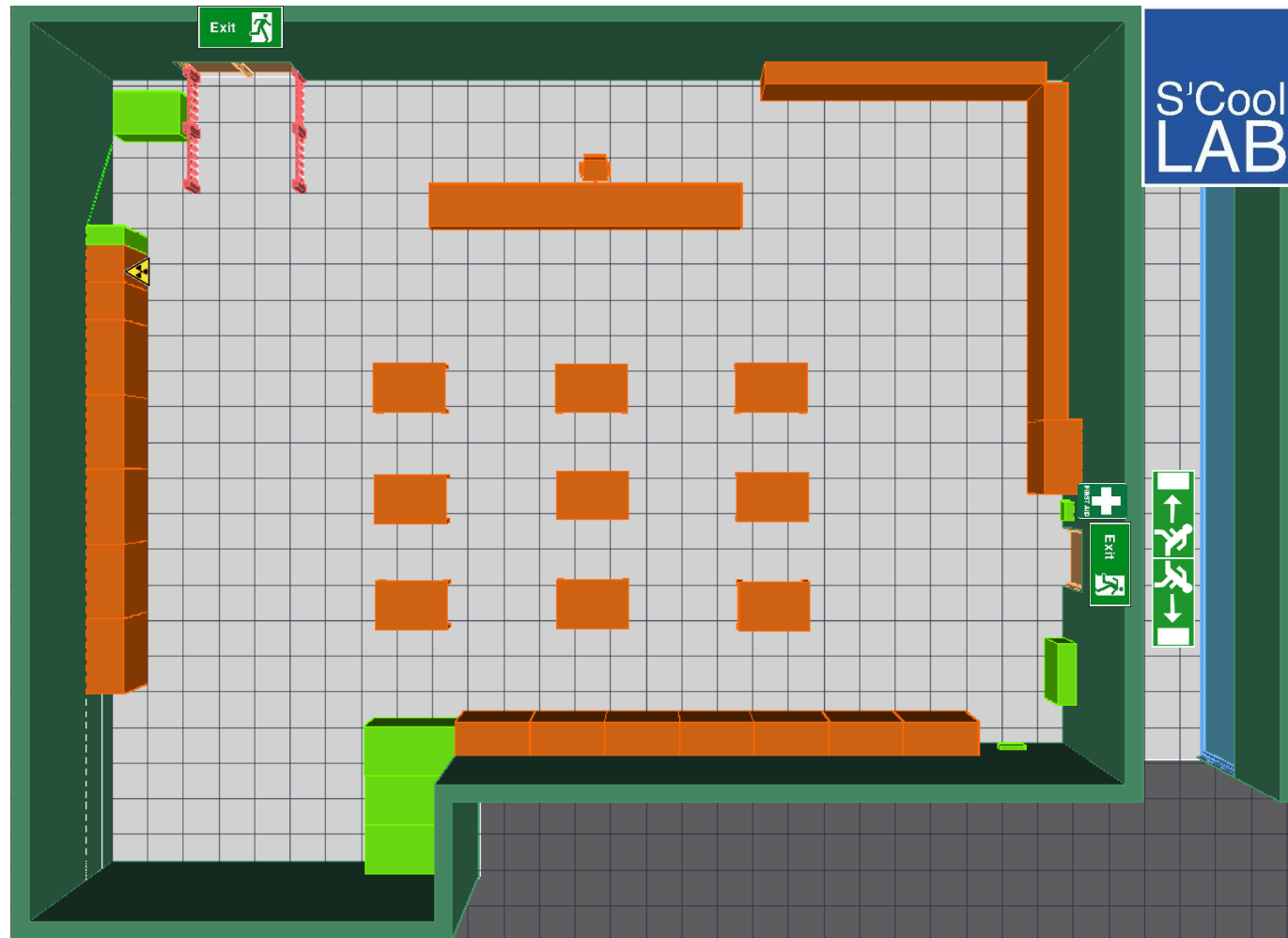
# Le Regole nel S'Cool LAB



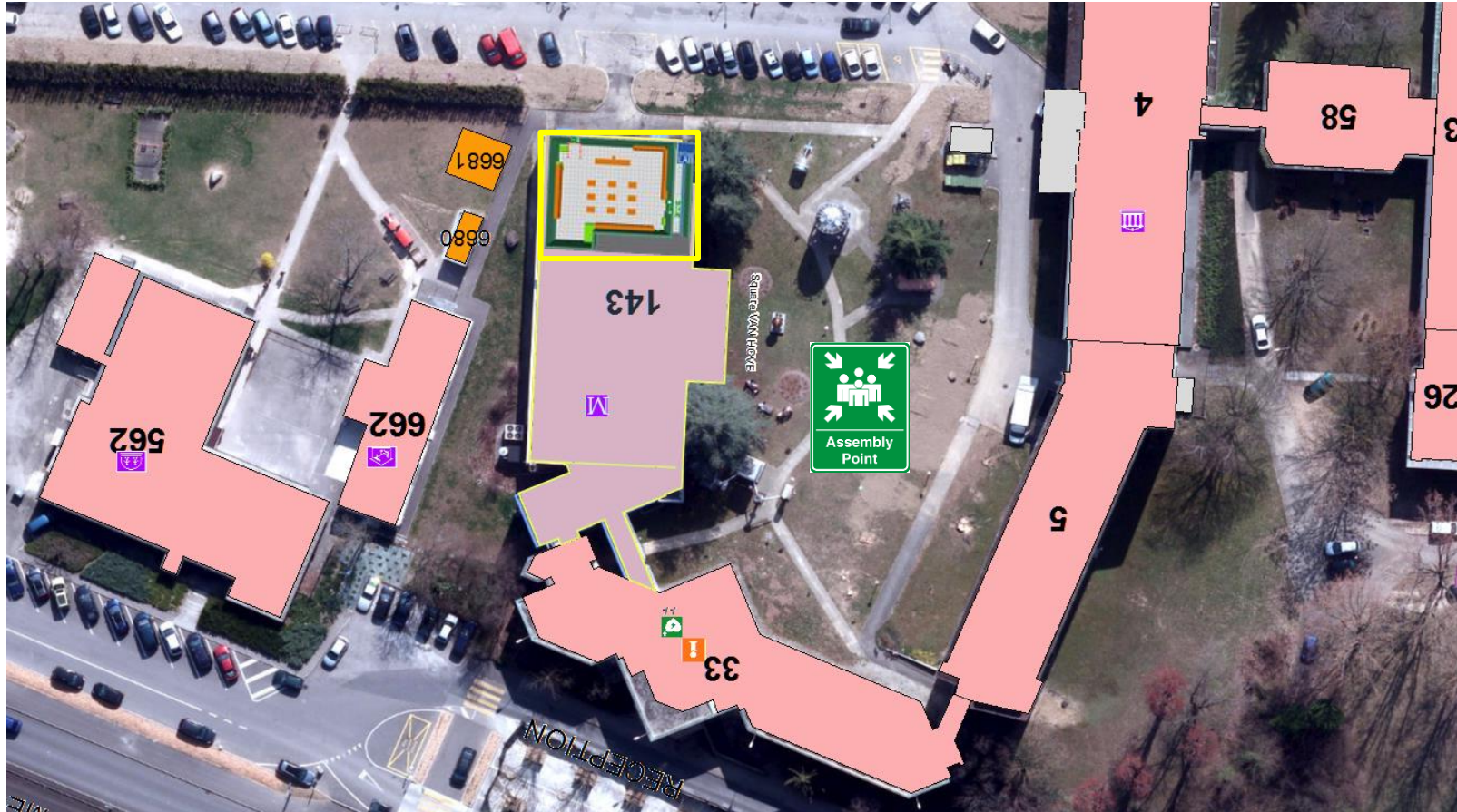
# Borse



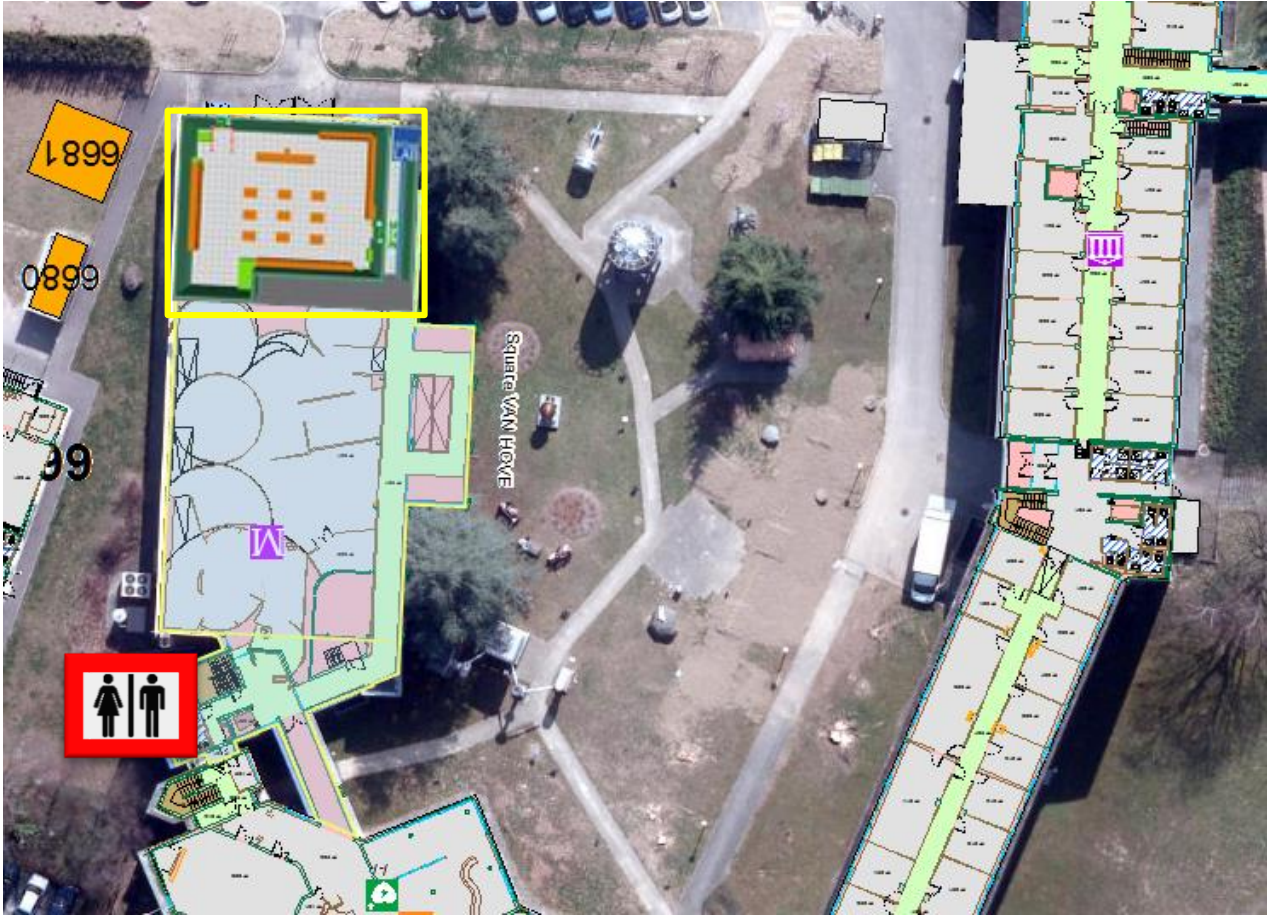
# Uscite di Emergenza



# Punto di raccolta



# Toilette



# Camera a Nebbia Workshop

# Sommario

- Storia
- Tutorial passo per passo
- Costruisci il tuo rivelatore di particelle
- Riordinare
- Discussione e spiegazioni



Storia

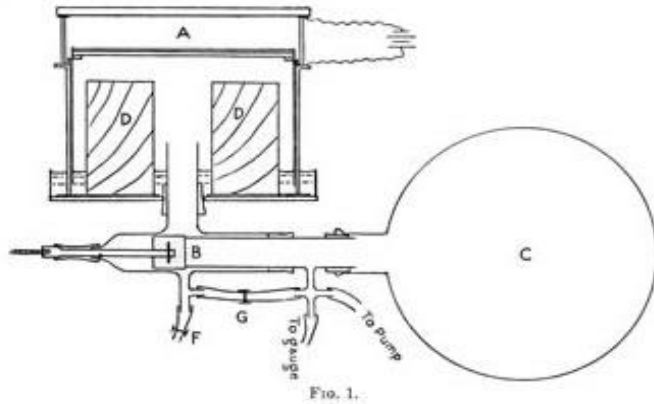
# Historique

## Charles T. R. Wilson (1869 - 1959)

Questo fisico scozzese perfezionò la prima (a espansione)

Camera a nebbia nel 1911 e

Ricevette il premio Nobel nel 1927



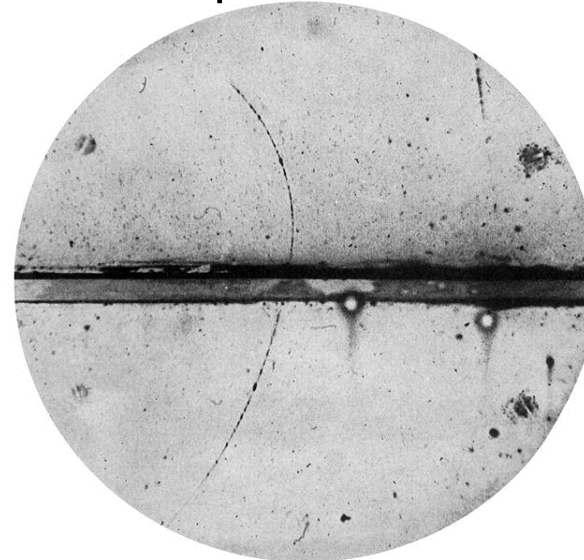
A diagram of Wilson's apparatus. The cylindrical cloud chamber ('A') is 16.5cm across by 3.4cm deep.

C. T. R. WILSON: *On an Expansion Apparatus for Making Visible the Tracks of Ionising Particles in Gases and Some Results Obtained by Its Use.* Proc. R. Soc. Lond. A. 1912 87 277-292 DOI:[10.1098/rspa.1912.0081](https://doi.org/10.1098/rspa.1912.0081)

## Carl Anderson (1905 - 1991)

Questo fisico scoprì il positrone nel 1932 e

Il muone nel 1936 usando una camera a nebbia. Ricette il premio Nobel nel 1936.



Carl D. Anderson (1905–1991) - Anderson, Carl D. (1933). "The Positive Electron". *Physical Review* 43 (6): 491–494. DOI:[10.1103/PhysRev.43.491](https://doi.org/10.1103/PhysRev.43.491).

Tutorial passo per passo

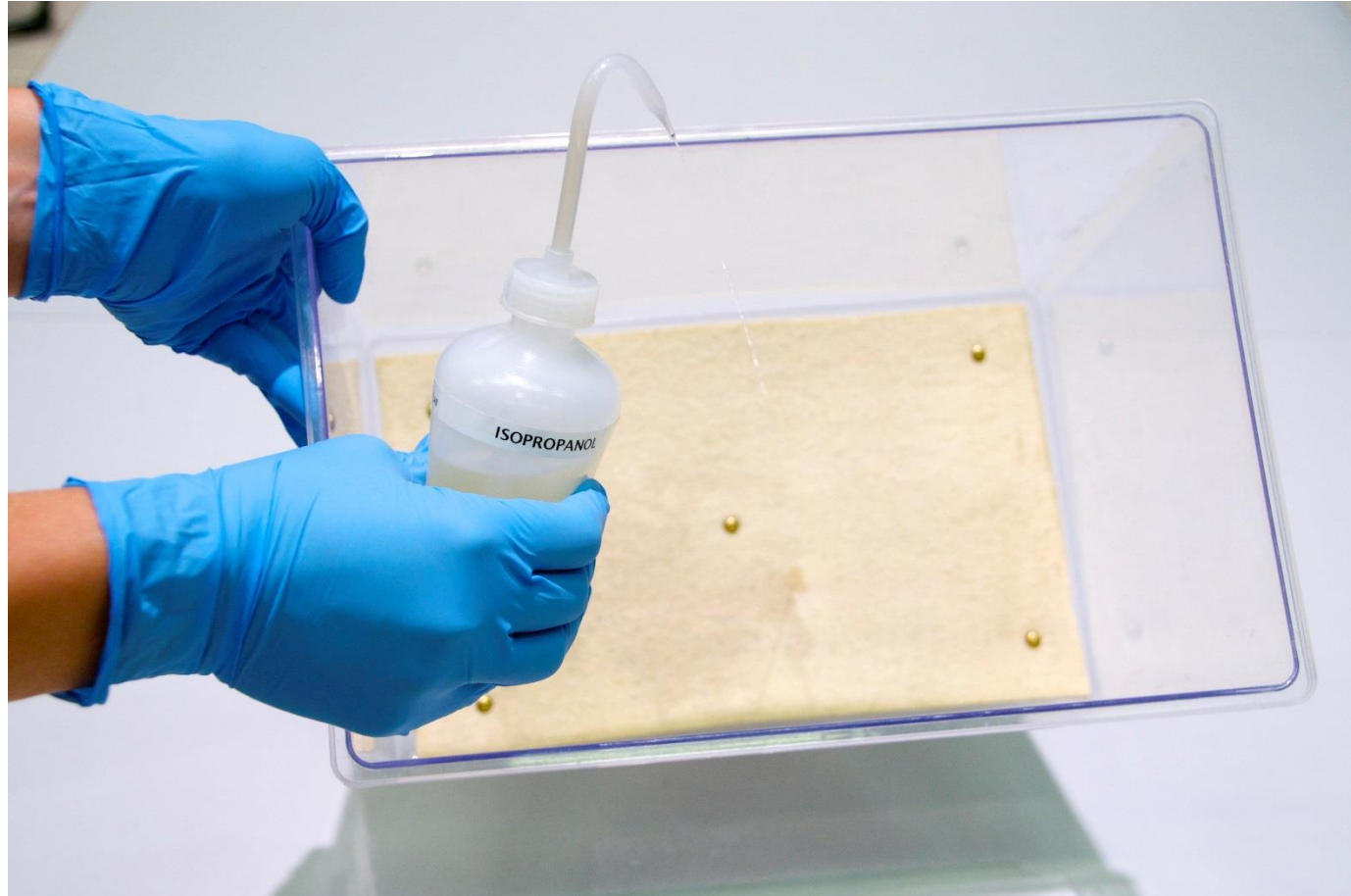
# Costruisci la tua camera a nebbia – passo per passo





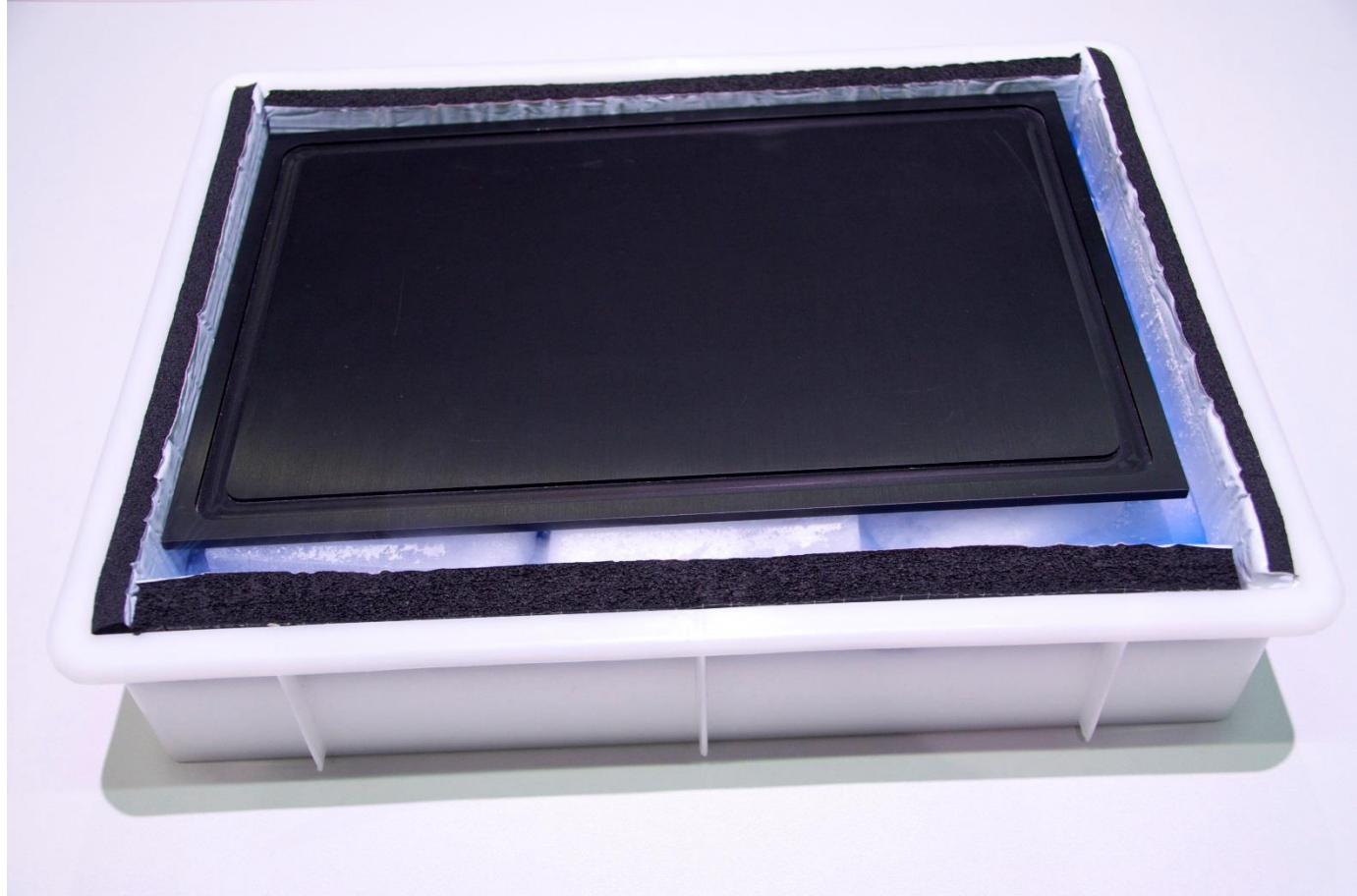


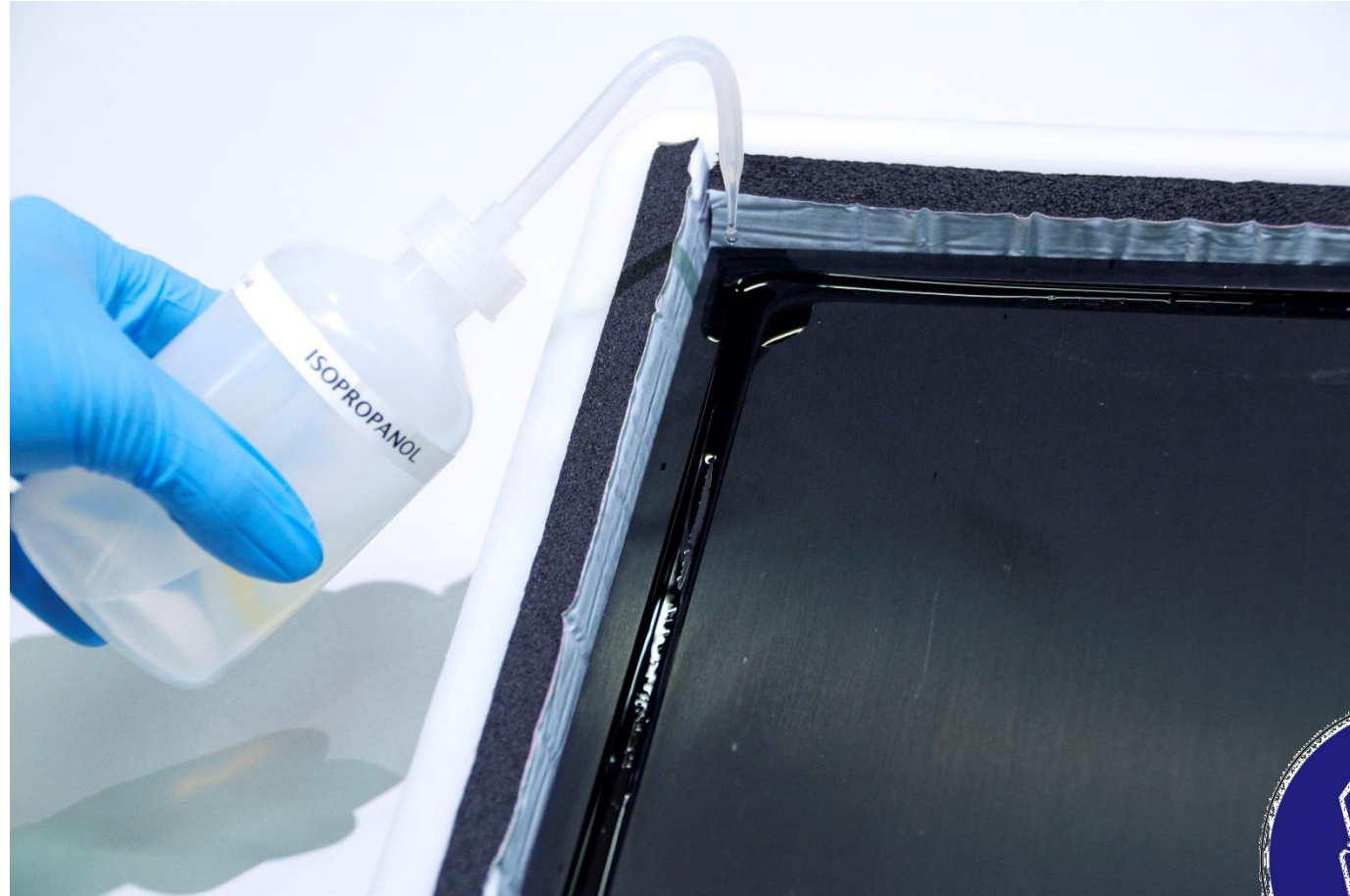




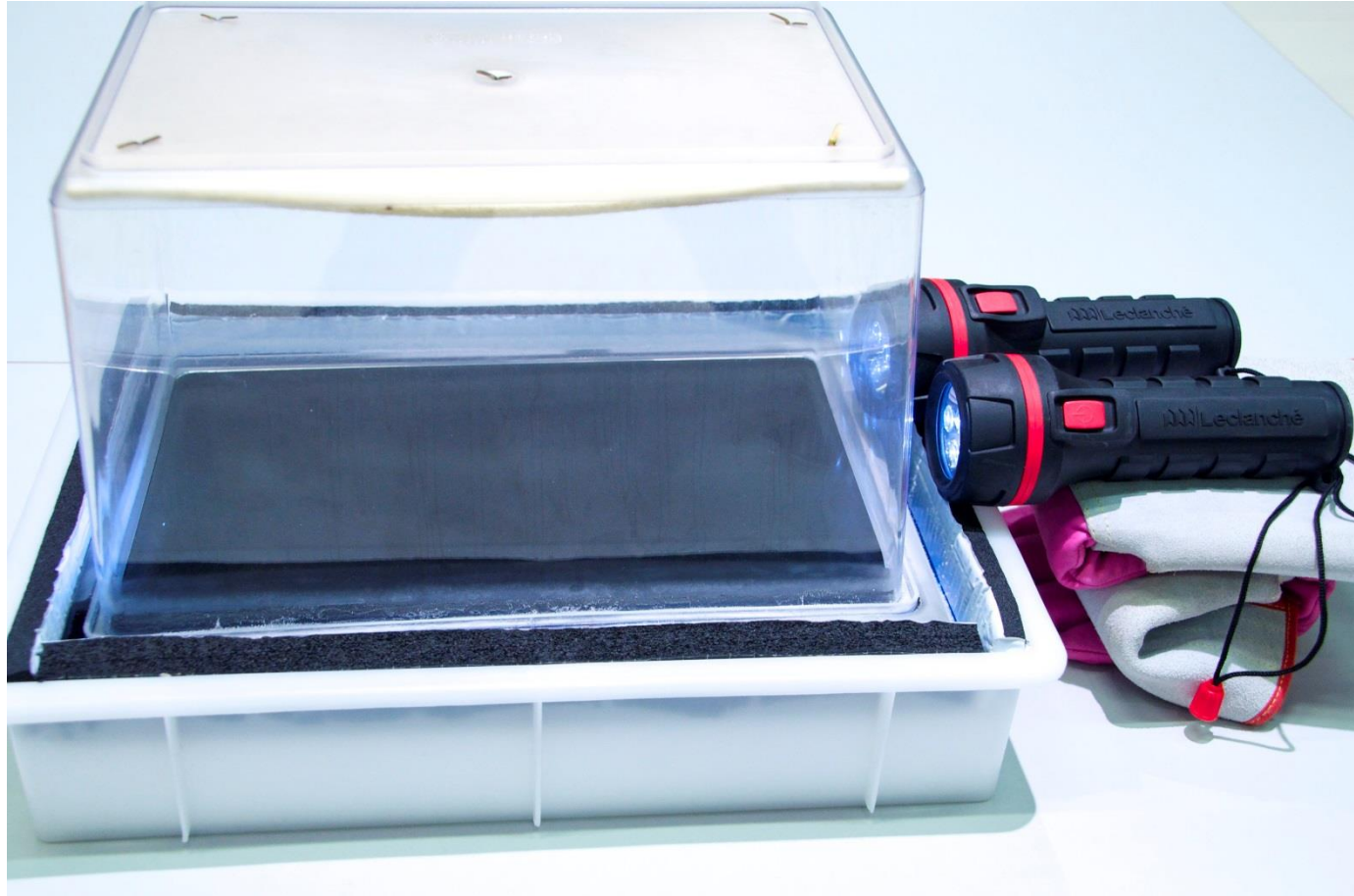




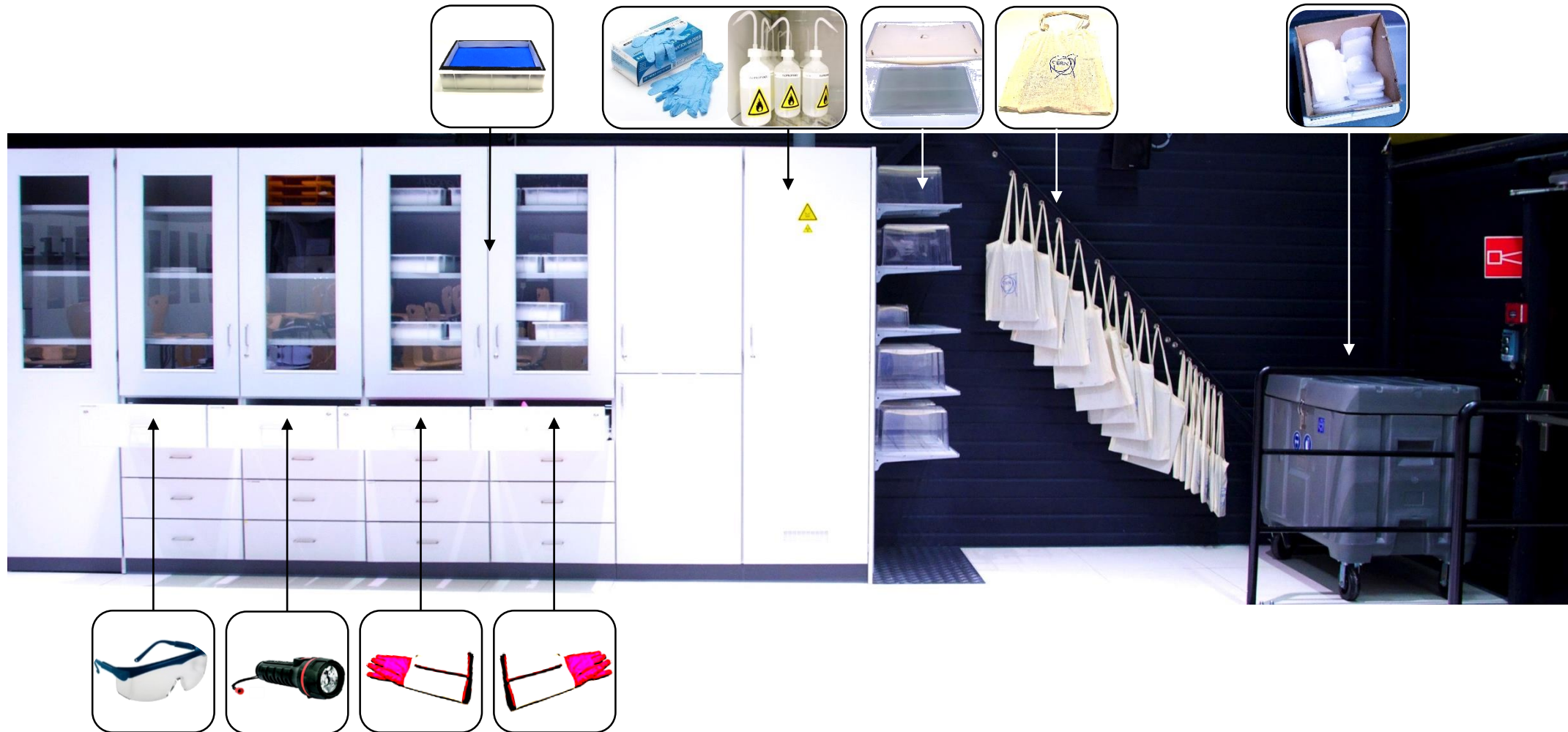








# 👉 Costruisci il tuo rivelatore di particelle!

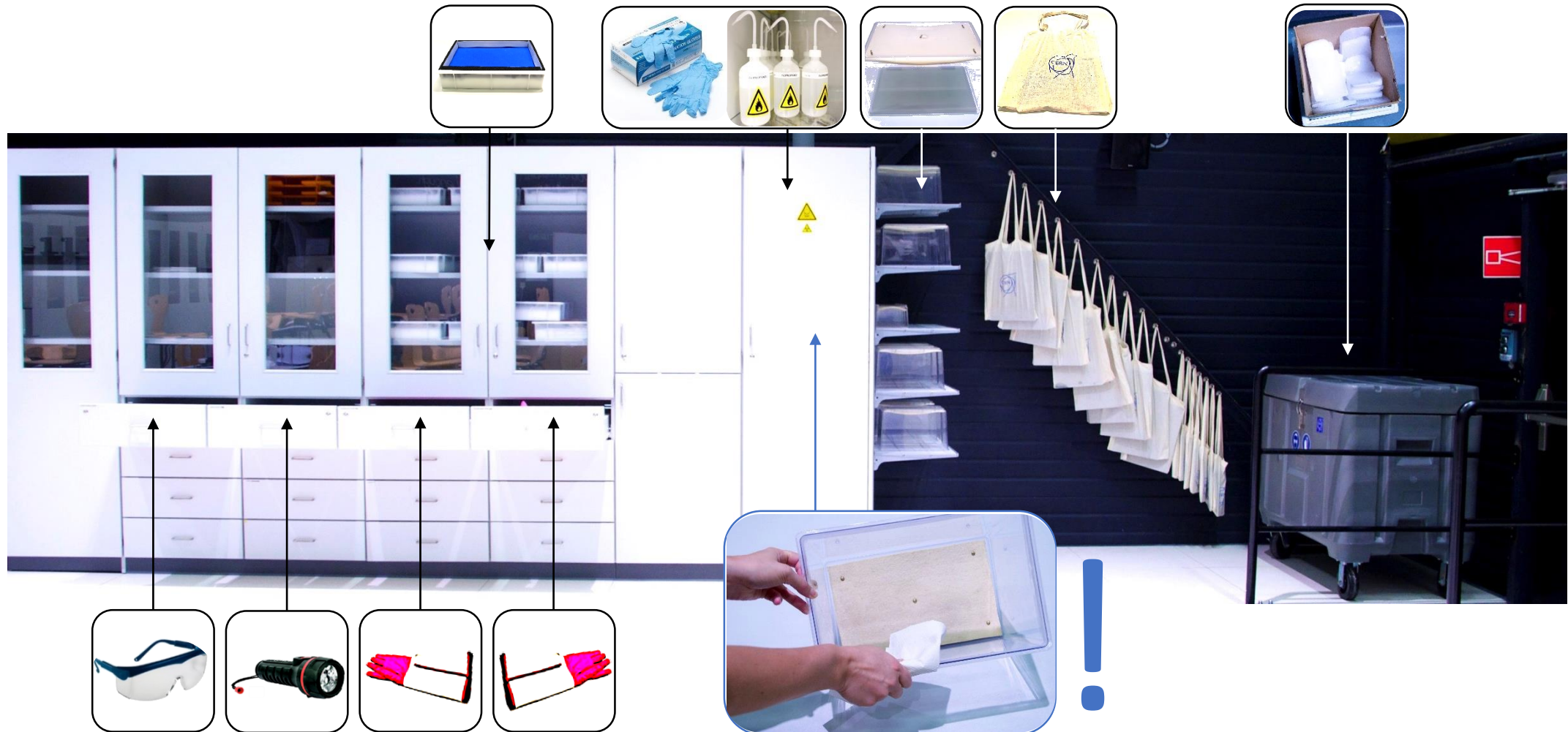


# Costruisci il tuo rivelatore di particelle!

- **Compiti**

- Osserva la tua Camera a nebbia
- Trova la posizione migliore per la tua pila e la migliore posizione di osservazione
- Descrivi le tracce visibili (forma, lunghezza, larghezza, ...)
- Discuti la ragione di queste tracce
- Conta il numero di tracce che puoi vedere in 1 minuto, ripeti questa misura 2 volte

# 👉 Riordinare





Discussione e spiegazioni

**Materiale aggiuntivo**

# Simulazione di uno sciame in aria

**Foto di uno sciame in aria di Raggi Cosmici**  
di H.-J. Drescher [drescher@th.physik.uni-frankfurt.de](mailto:drescher@th.physik.uni-frankfurt.de).

Sciame in aria sono cascate di particelle secondarie indotte nell'atmosfera da raggi cosmici ad alta energia. Ciò che vedi qui è una **visualizzazione di simulazioni realistiche di questi sciame**. Ovviamente, non sono mostrate tutte queste particelle nello sciame, ce ne sono troppe! La **parte mostrata qui è di circa  $1e-6$** , raccolte con un **algoritmo di assottigliamento**

blue:electrons/positrons

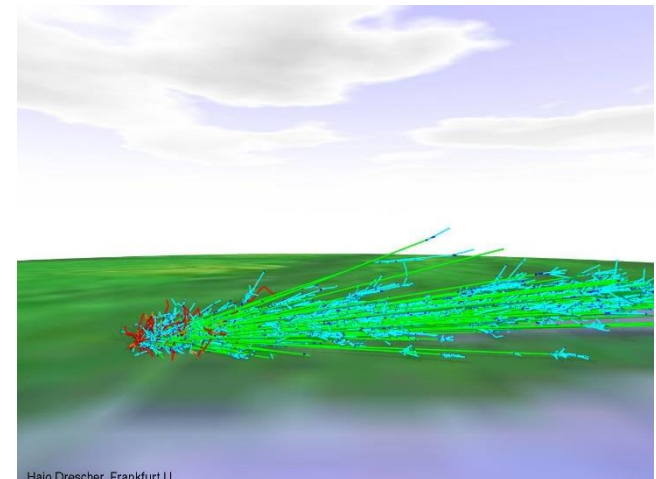
cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons



<http://th.physik.uni-frankfurt.de/~drescher/CASSIM/>

blue:electrons/positrons

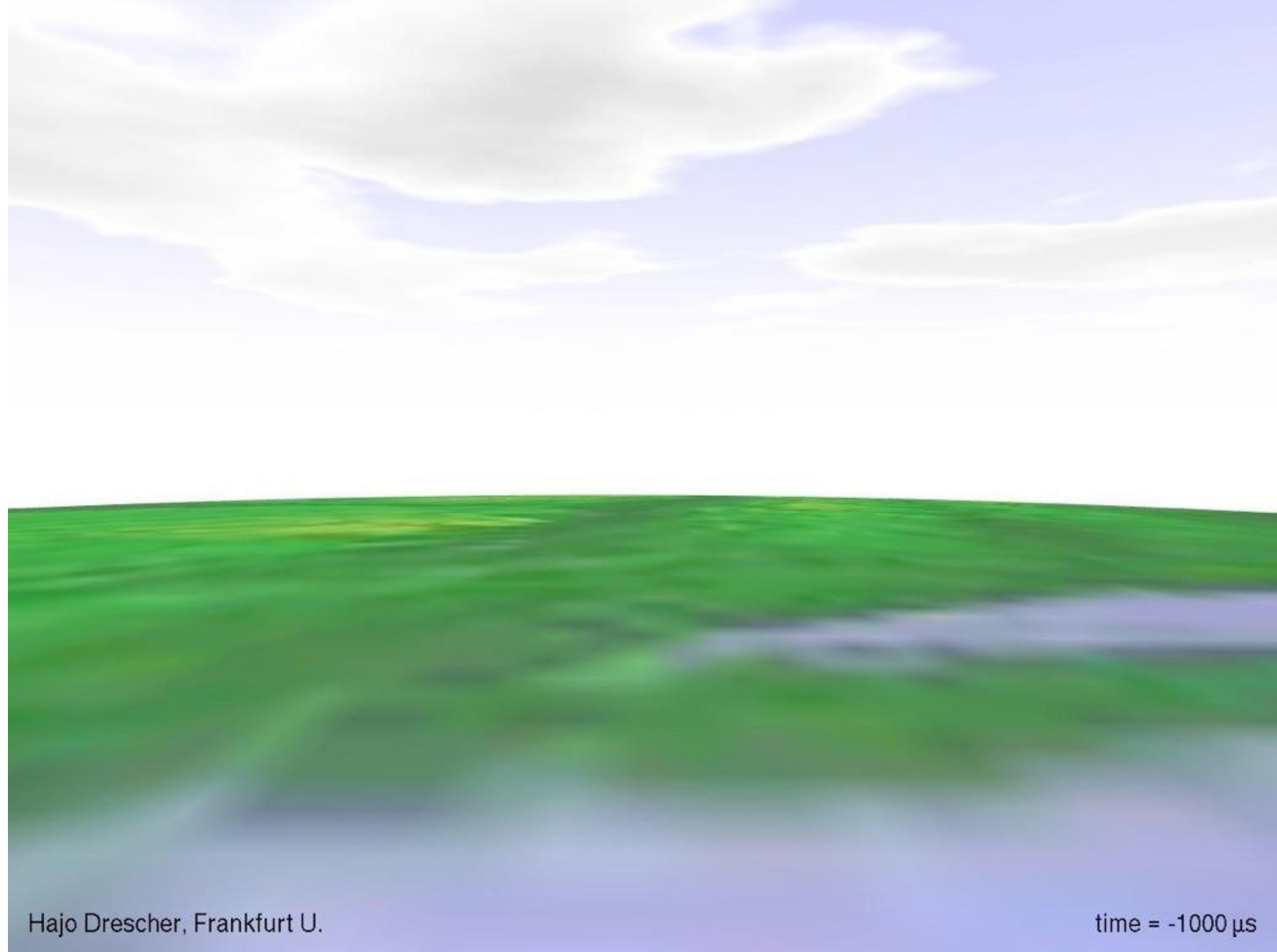
cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons



blue:electrons/positrons

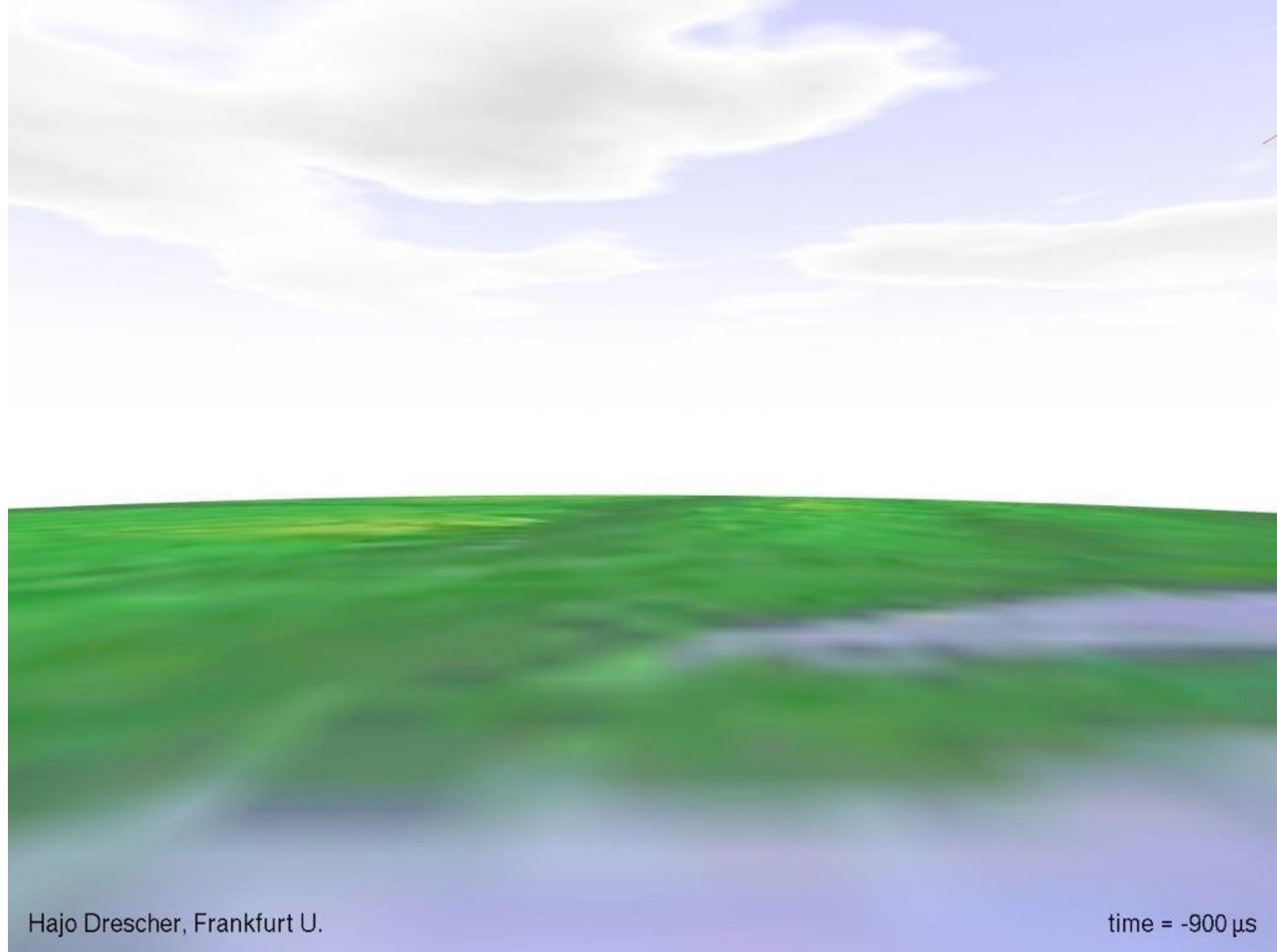
cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons



blue:electrons/positrons

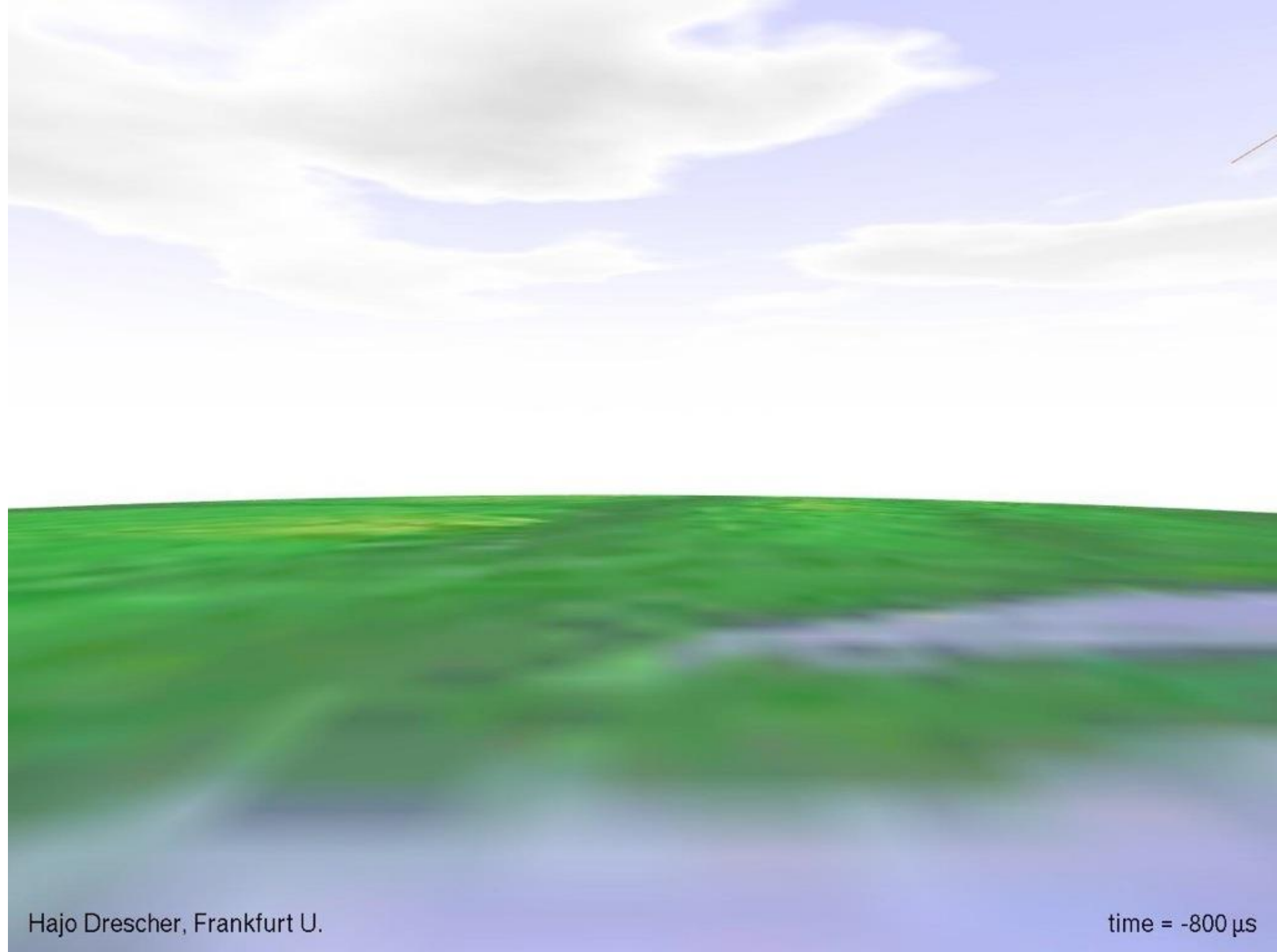
cyan:photons

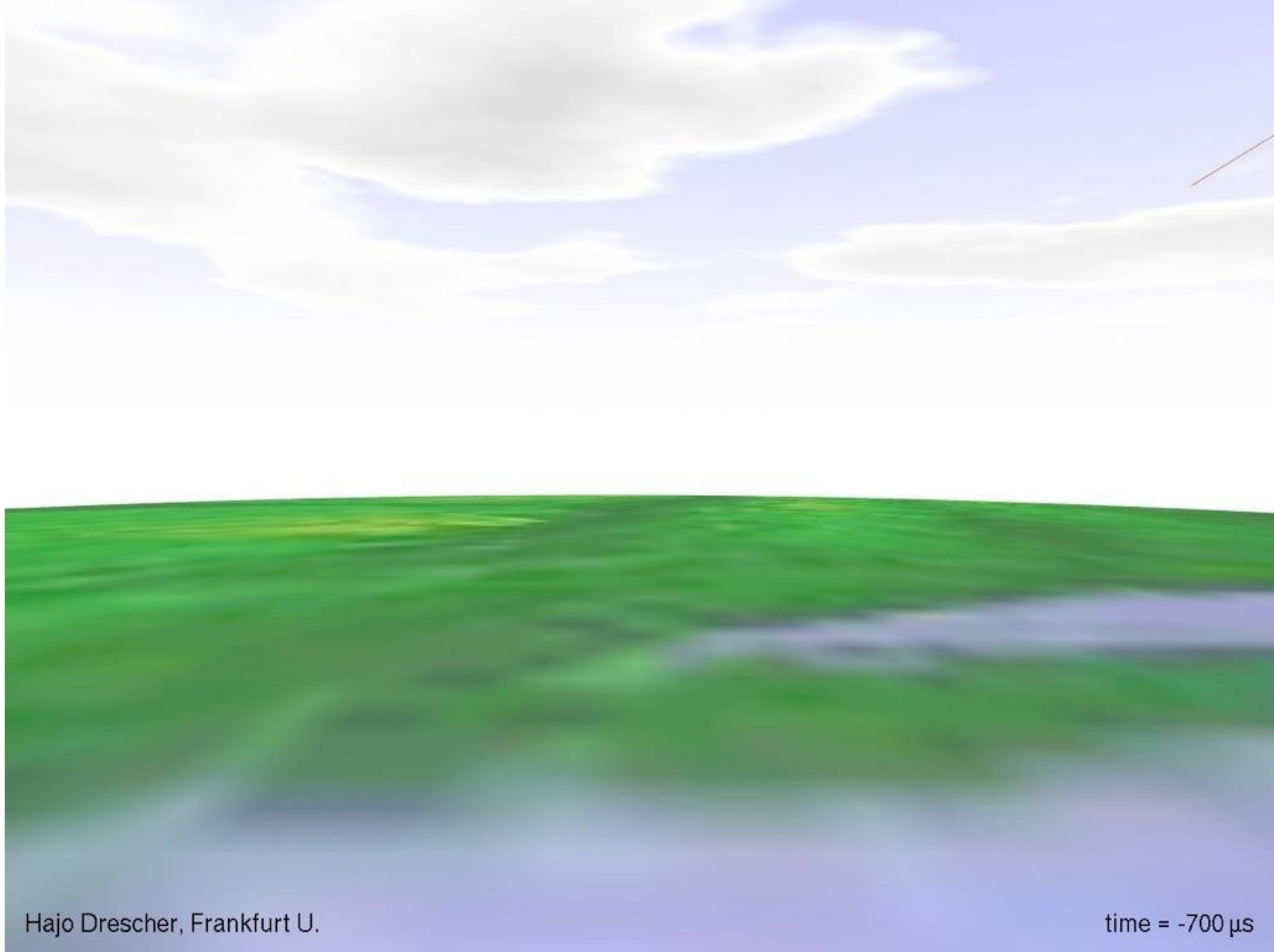
red:neutrons

orange: protons

gray: mesons

green:muons





blue:electrons/positrons

cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons

blue:electrons/positrons

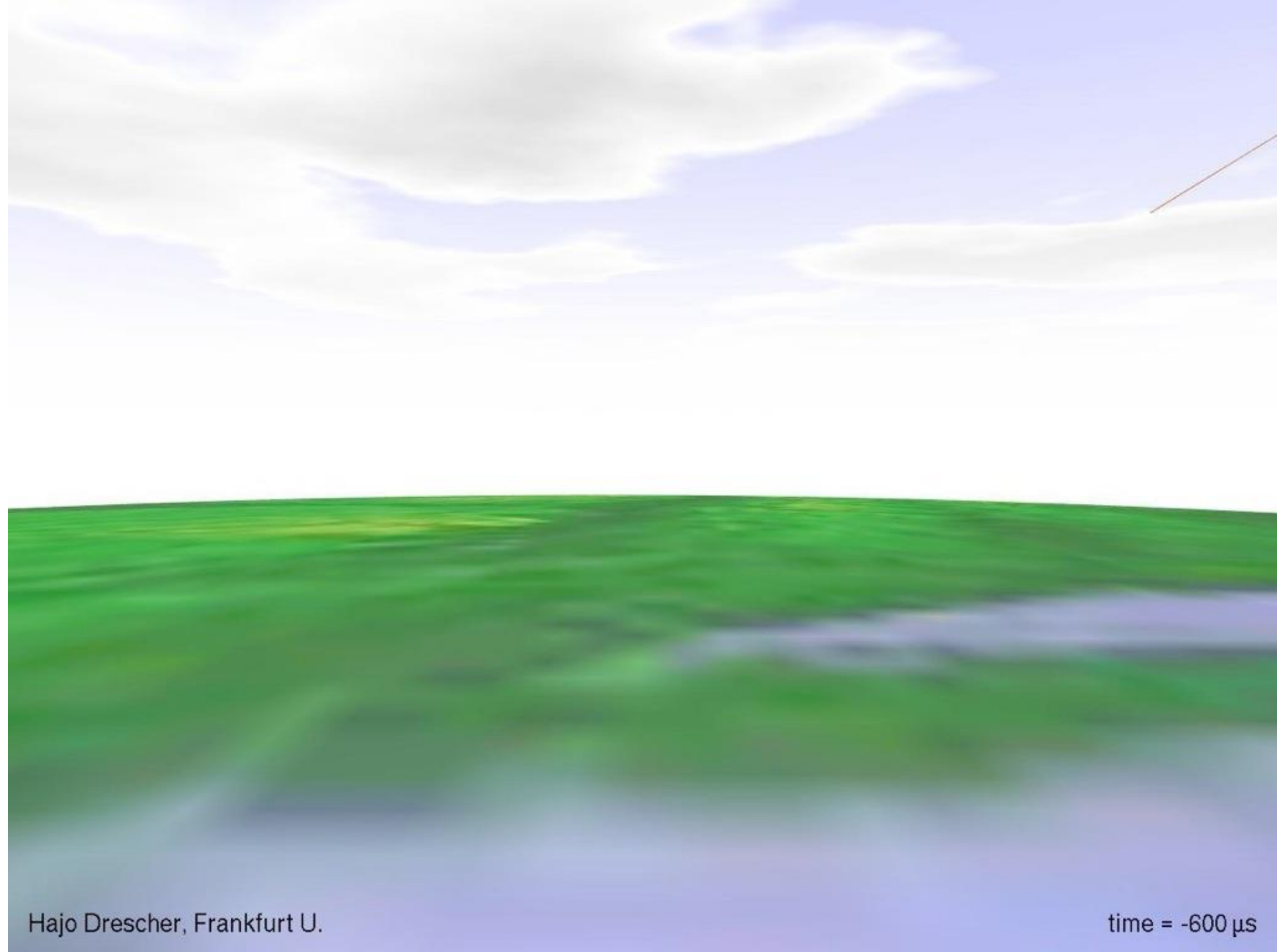
cyan:photons

red:neutrons

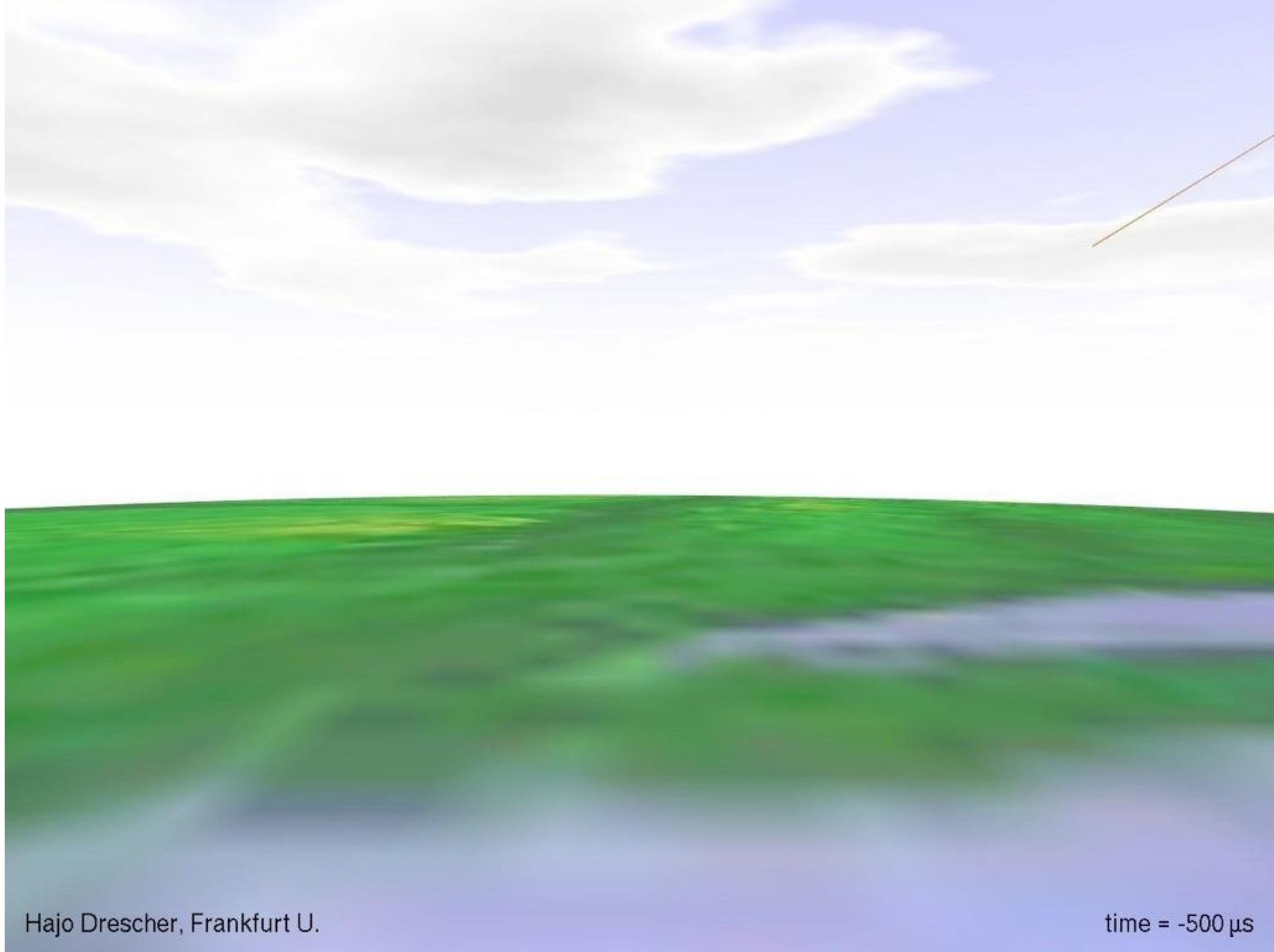
orange: protons

gray: mesons

green:muons







blue:electrons/positrons

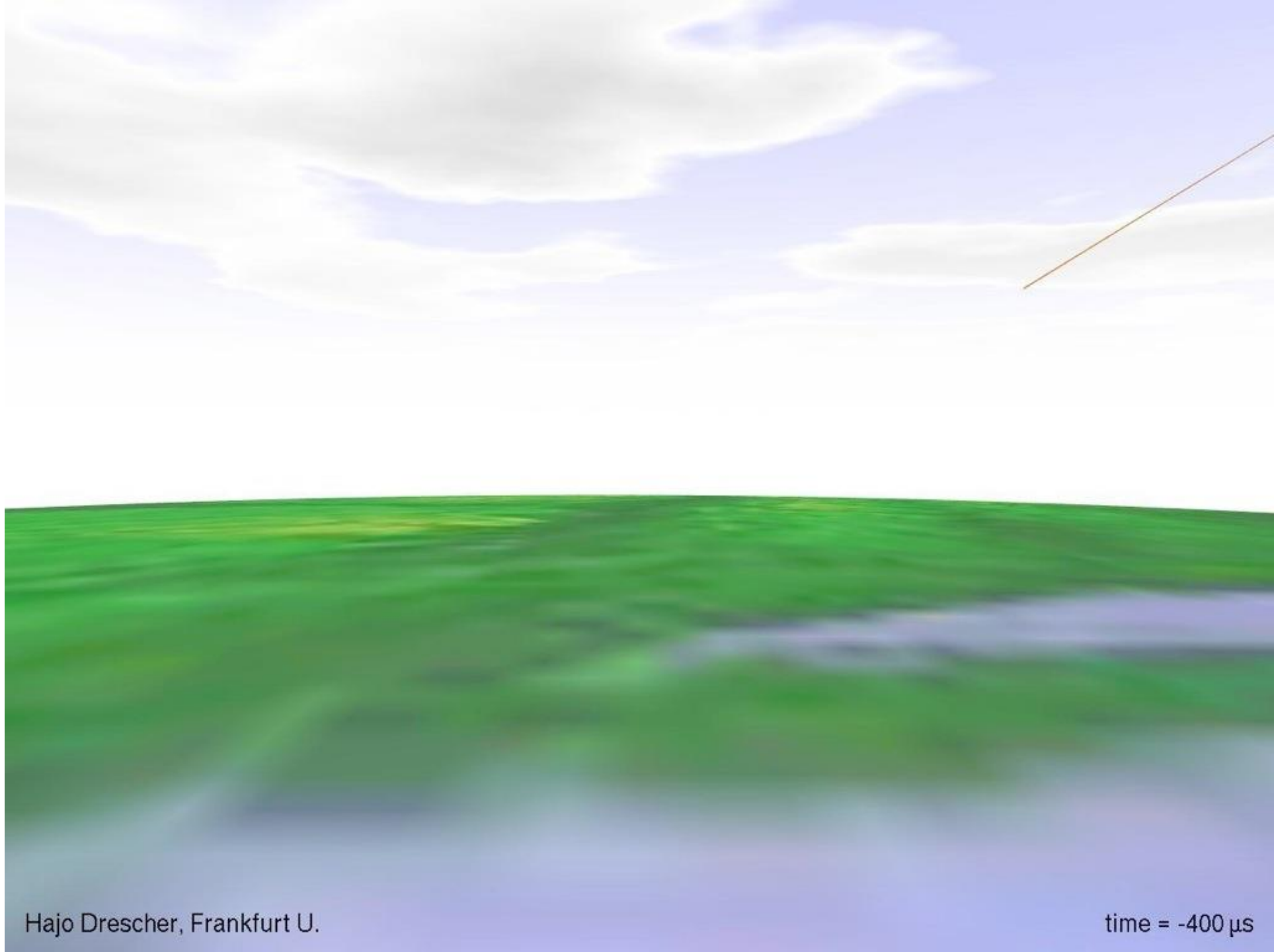
cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons



blue:electrons/positrons

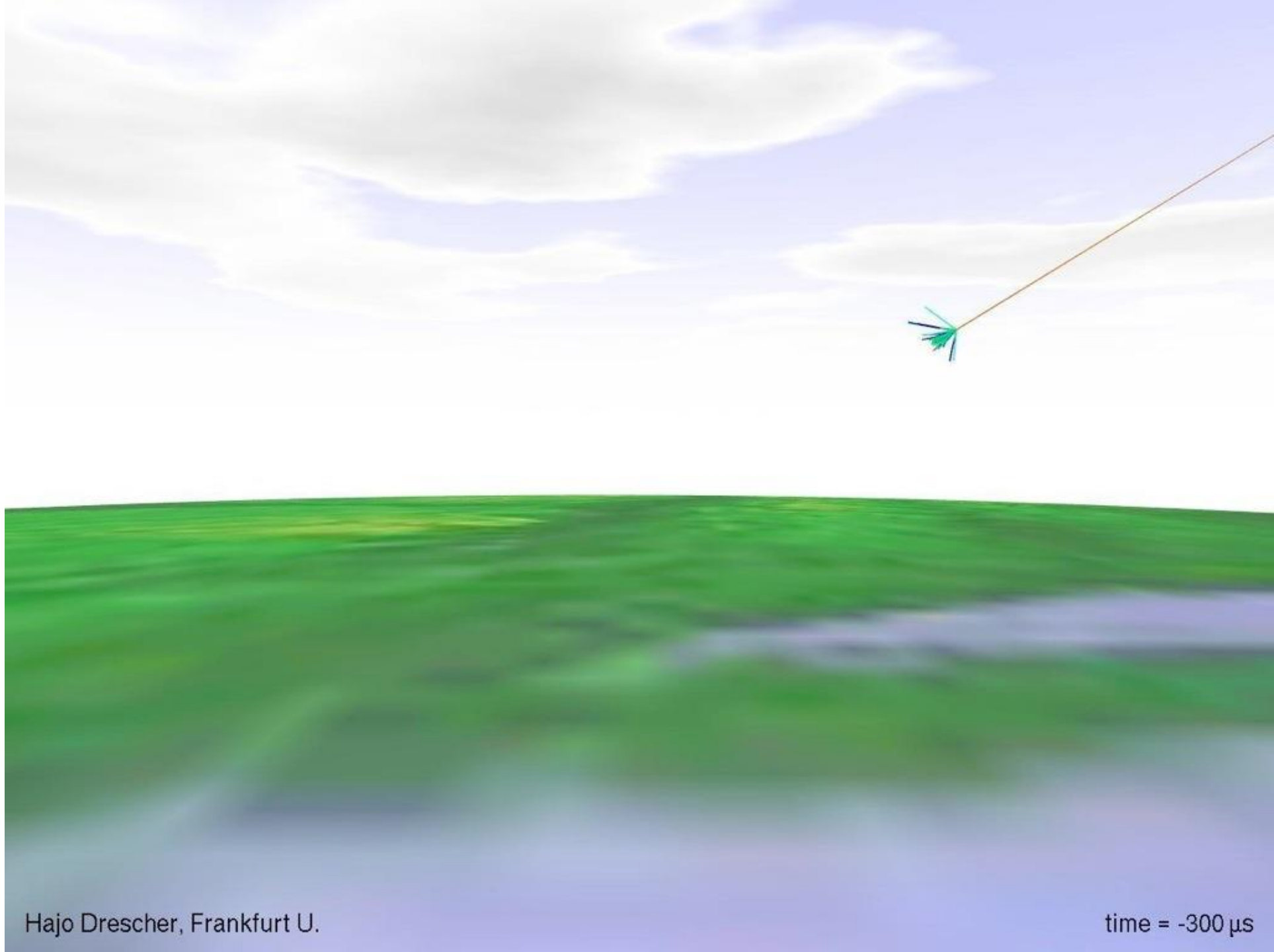
cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons



blue:electrons/positrons

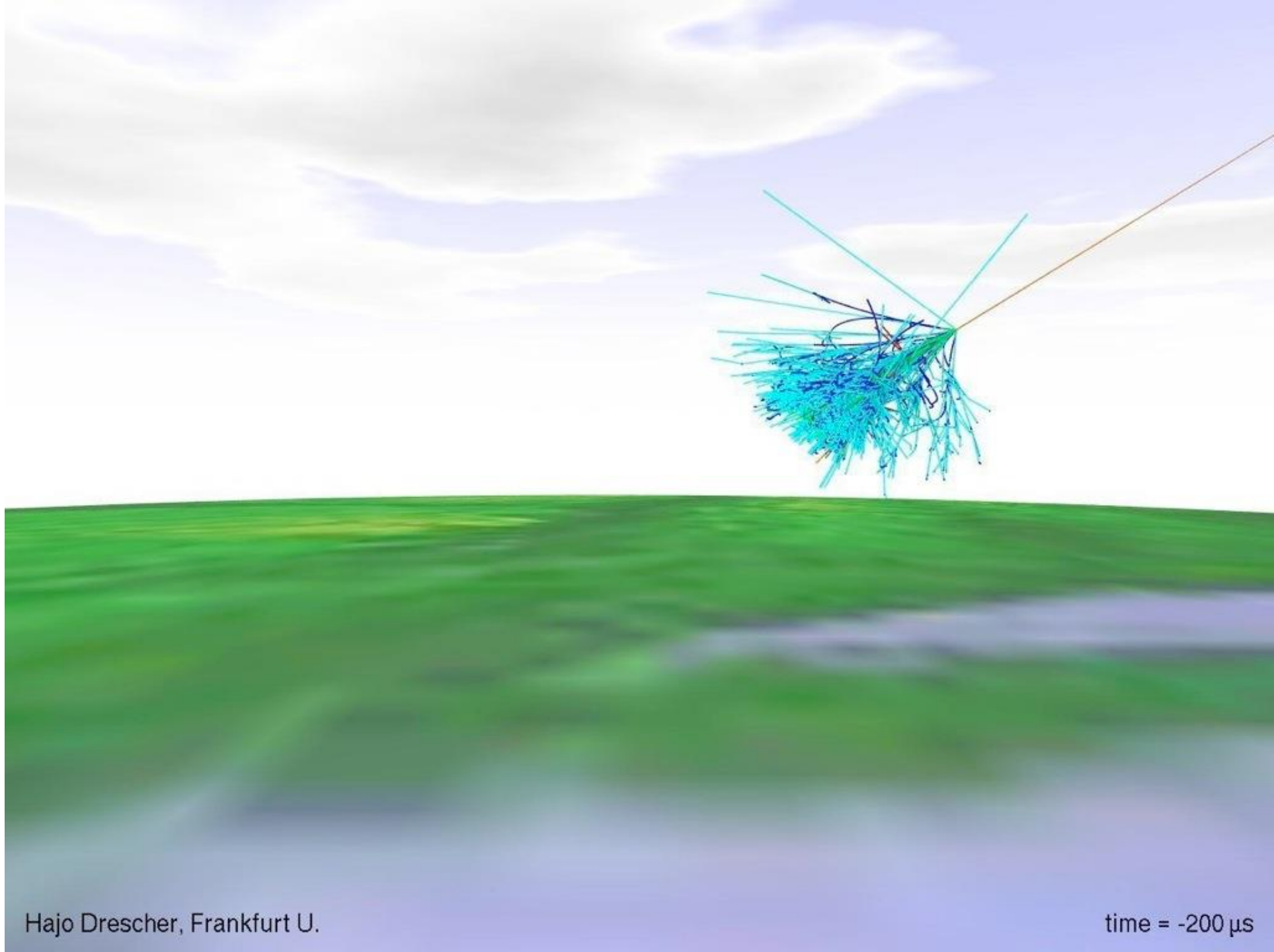
cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons



blue:electrons/positrons

cyan:photons

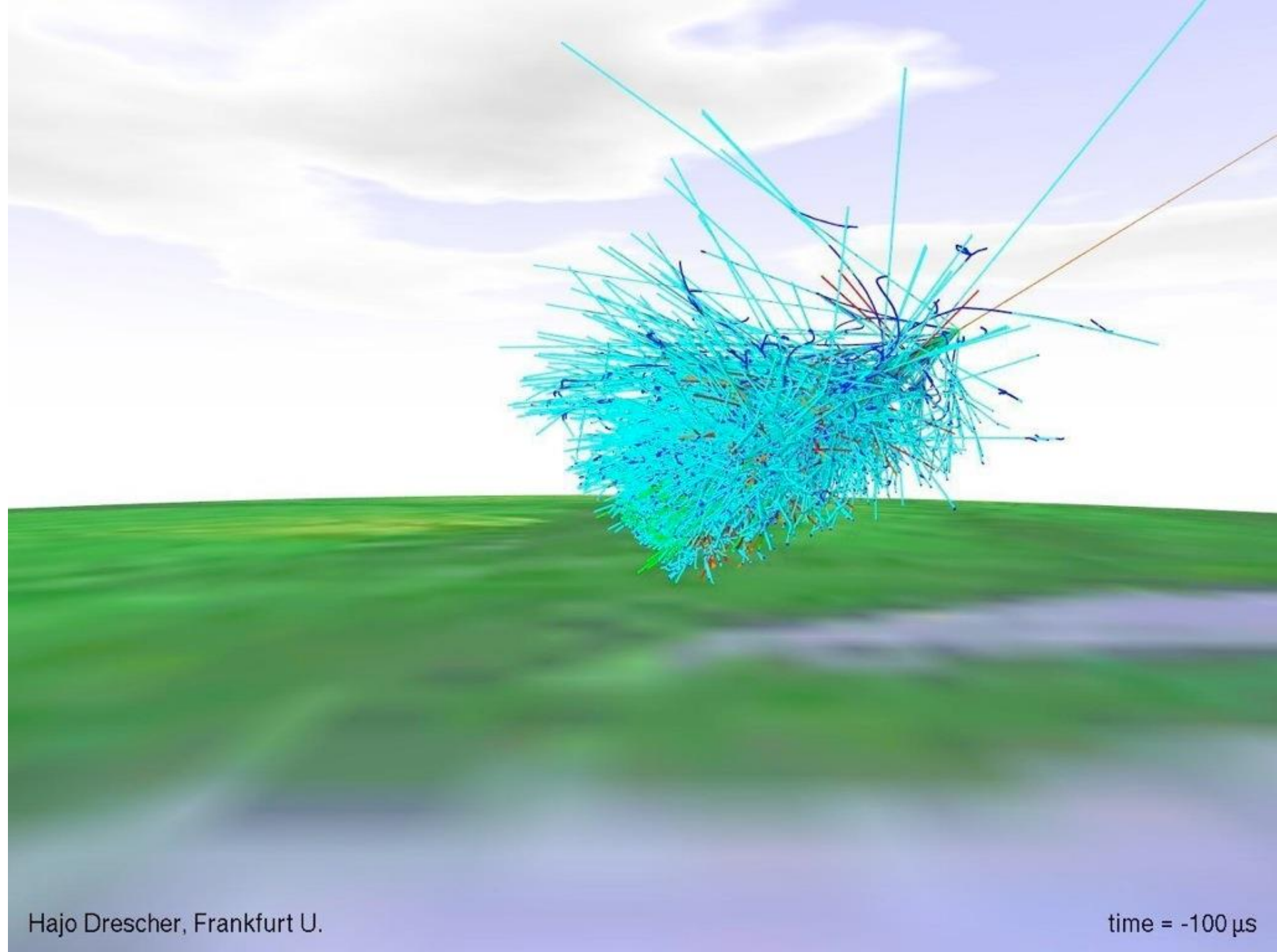
red:neutrons

orange: protons

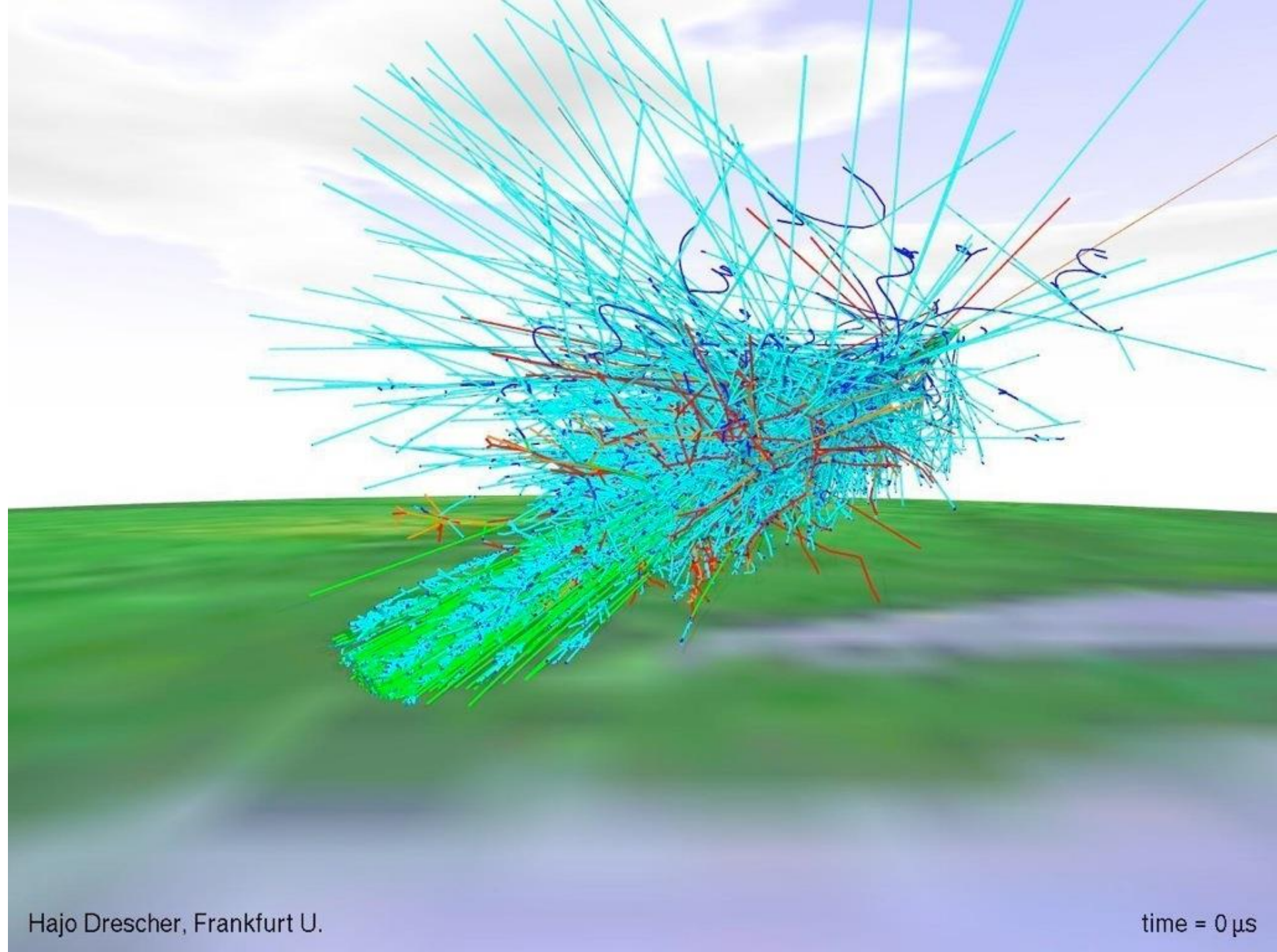
gray: mesons

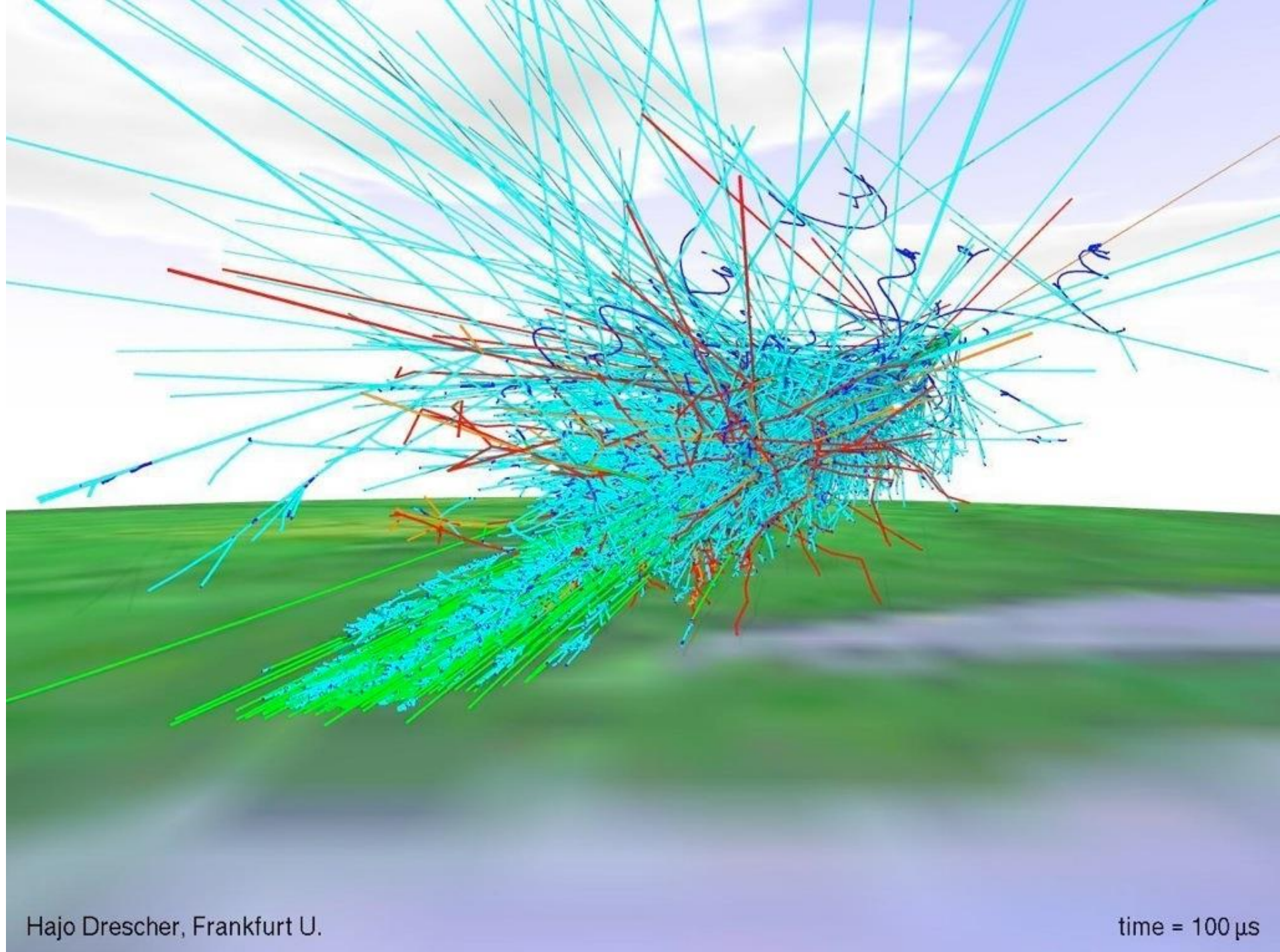
green:muons

blue:electrons/positrons  
cyan:photons  
red:neutrons  
orange: protons  
gray: mesons  
green:muons



blue:electrons/positrons  
cyan:photons  
red:neutrons  
orange: protons  
gray: mesons  
green:muons





blue:electrons/positrons

cyan:photons

red:neutrons

orange: protons

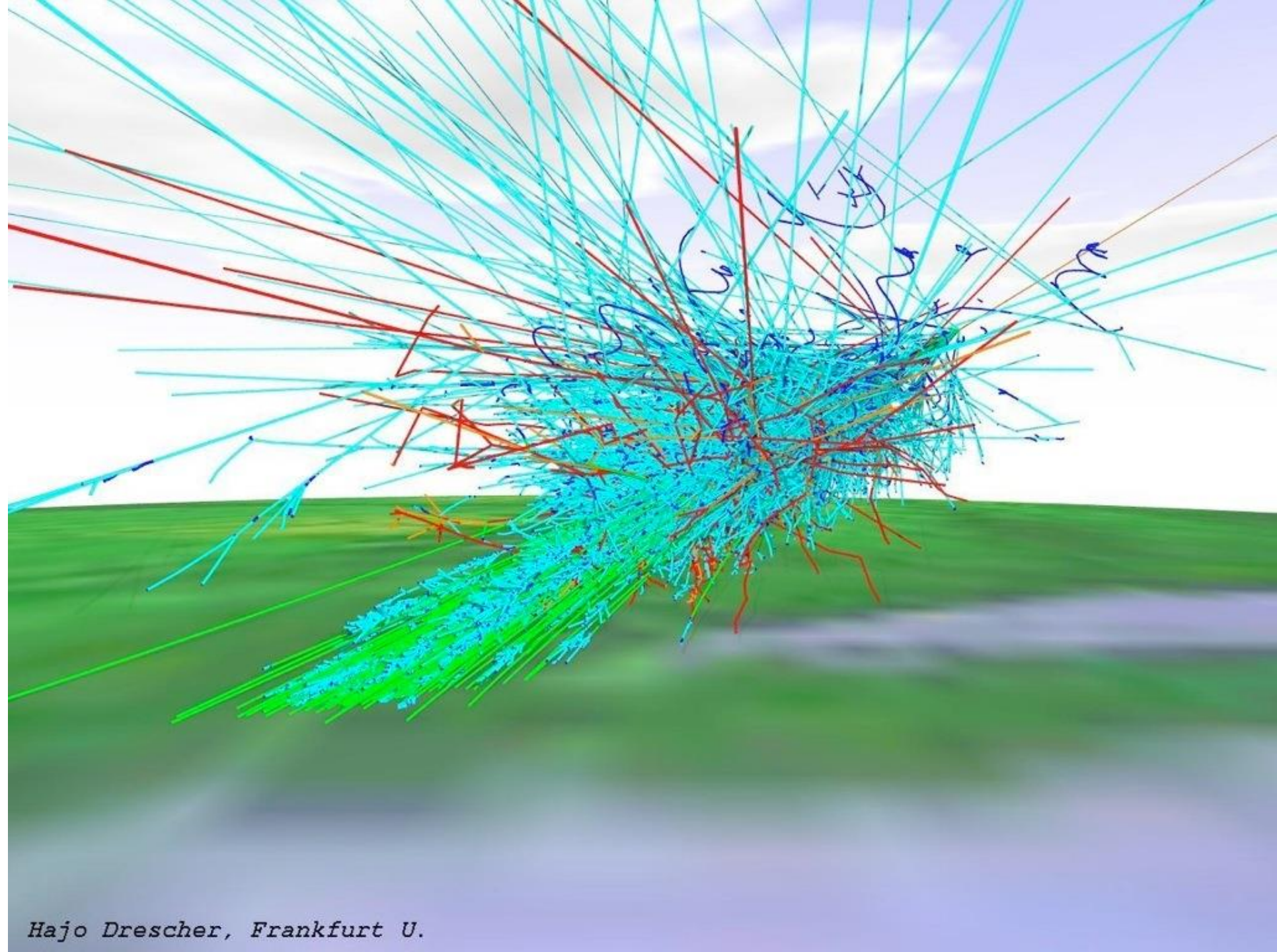
gray: mesons

green:muons

Hajo Drescher, Frankfurt U.

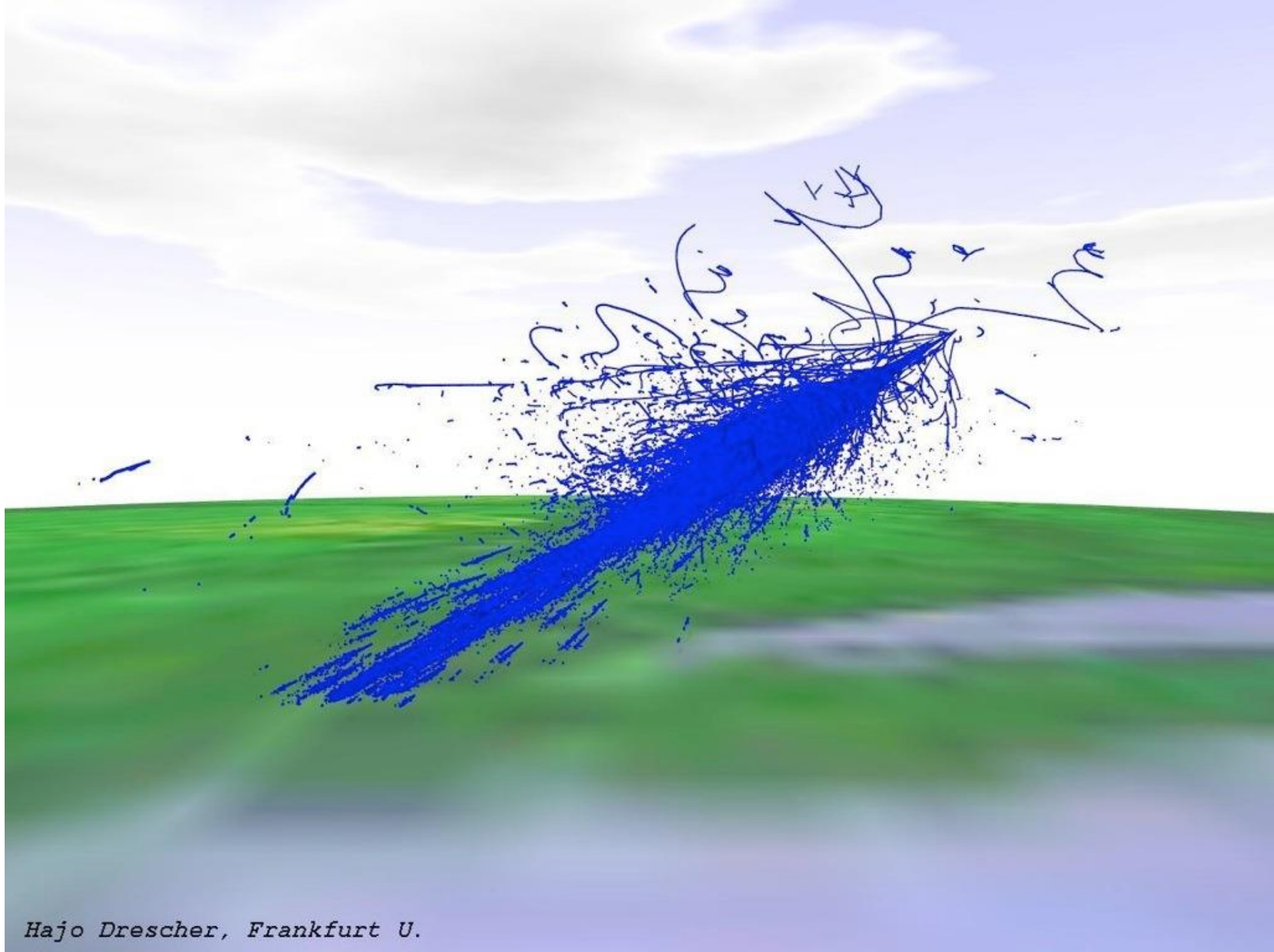
time = 100  $\mu$ s

blue:electrons/positrons  
cyan:photons  
red:neutrons  
orange: protons  
gray: mesons  
green:muons



*Hajo Drescher, Frankfurt U.*





blue:electrons/positrons

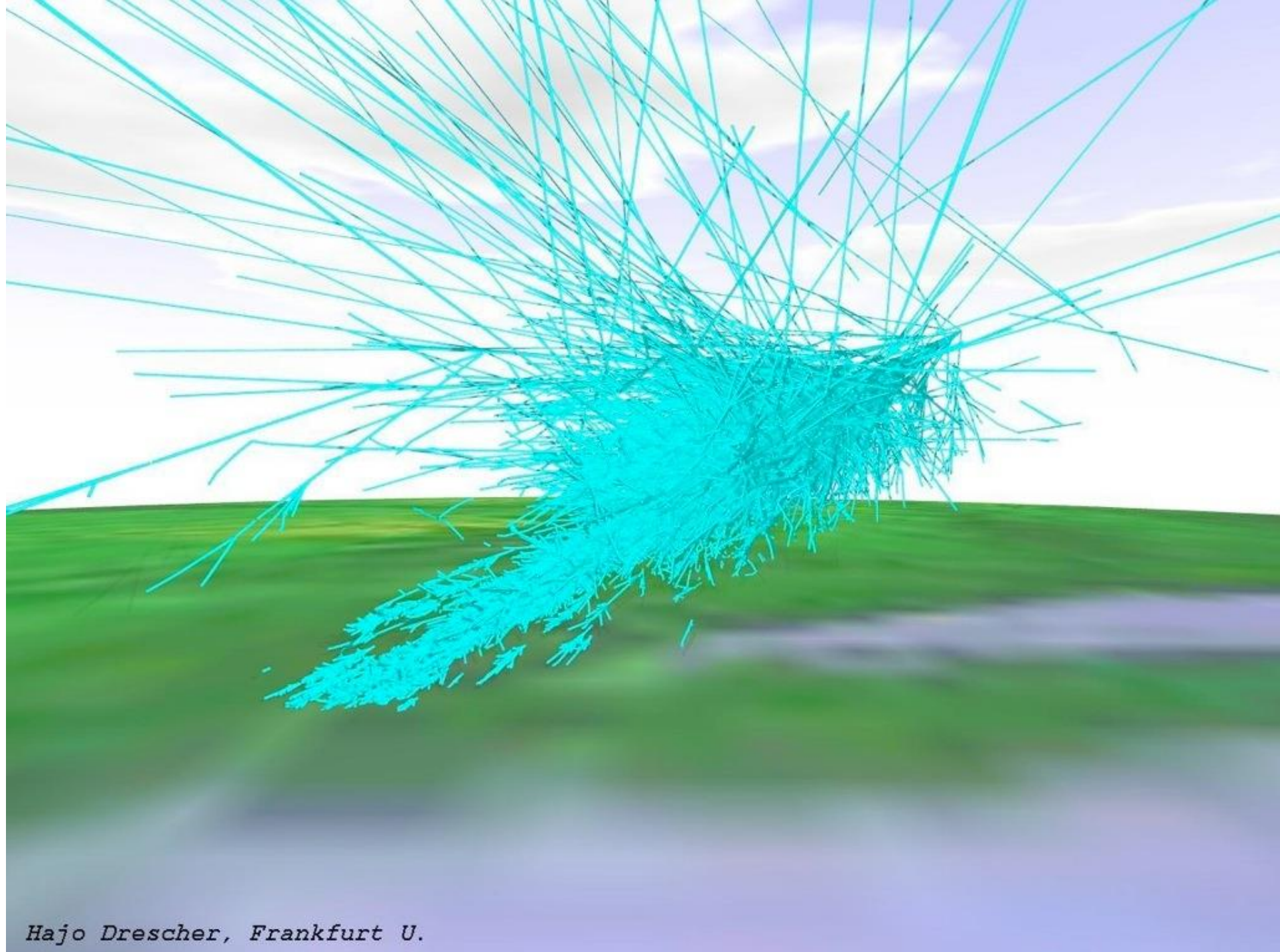
cyan:photons

red:neutrons

orange: protons

gray: mesons

green:muons



blue:electrons/positrons

cyan:photons

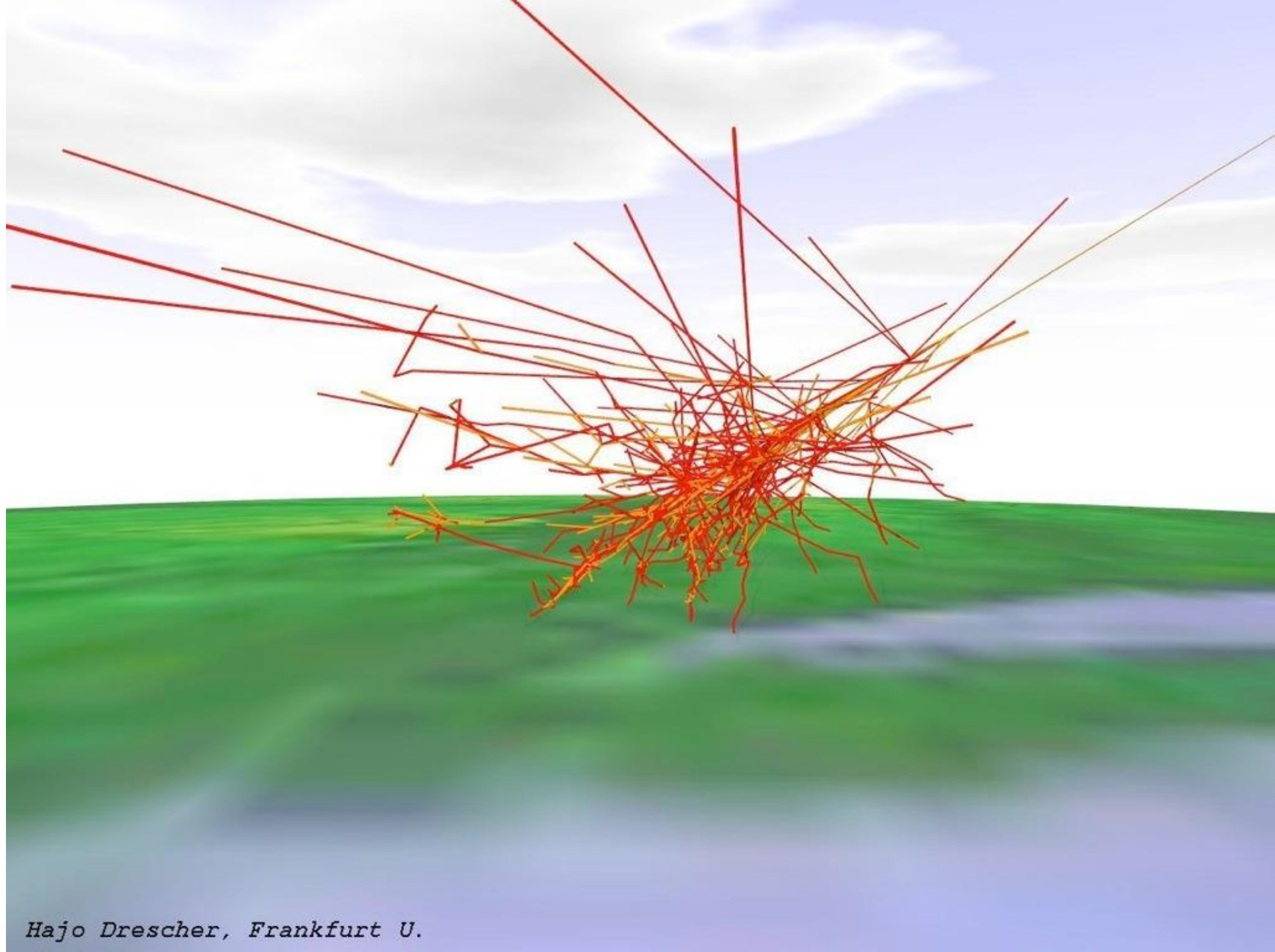
red:neutrons

orange: protons

gray: mesons

green:muons

*Hajo Drescher, Frankfurt U.*



blue:electrons/positrons

cyan:photons

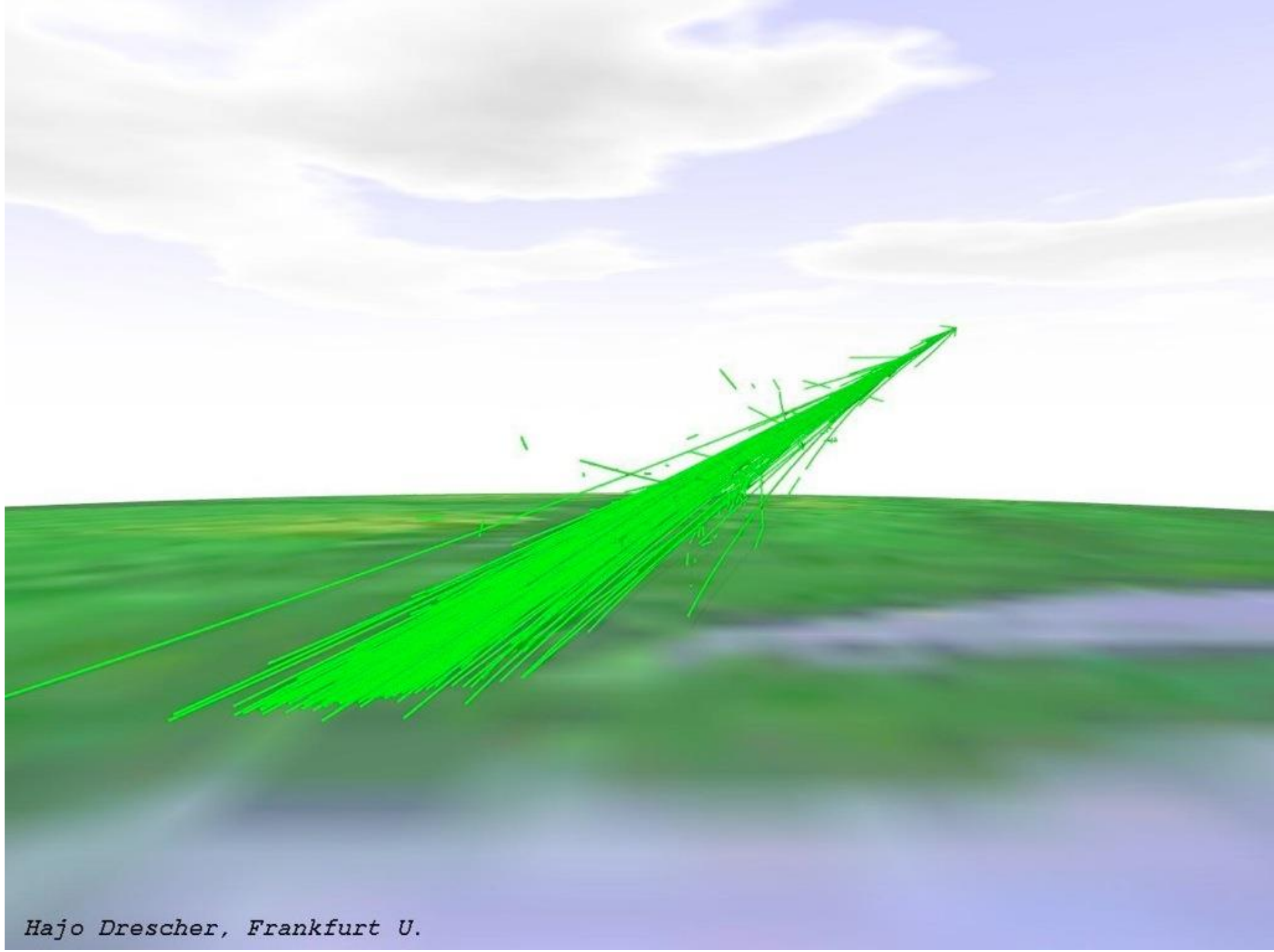
red:neutrons

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gray: mesons

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*Hajo Drescher, Frankfurt U.*



blue:electrons/positrons

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