

# **EnvirVis 2025**

## **Workshop on Visualisation in Environmental Sciences**

**Luxembourg City, Luxembourg**

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## Keynote

### **Advancing Meteorological Analysis through Interactive 3D Visualization: The Met.3D Open Research Software**

*Marc Rautenhaus*

#### **Abstract**

Visualization is an indispensable tool for weather forecasters, atmospheric researchers, and meteorology students to analyse both numerical simulations and observational data. Despite significant advances in visualization research and computer graphics, the adoption of new techniques within the meteorological community has been slow, with traditional 2D maps and diagrams still prevailing. In this talk, I share our journey of introducing interactive, 3D, and feature-based visualization into meteorology. After a brief overview of the historical evolution of 3D visualization for weather data, I present our work on Met.3D—an open-source software developed to advance meteorological analysis. Met.3D serves as a domain-specific tool for meteorologists, bridging the gap between established 2D techniques and innovative 3D interactive approaches. For visualization researchers, Met.3D offers a framework to integrate novel visualization techniques in a meteorological context. Drawing on case studies from meteorological teaching, weather forecasting, and atmospheric research, I discuss our experiences and the impact of introducing interactive 3D visualization. I conclude by highlighting open challenges and opportunities for future collaboration between the visualization and meteorology communities.