

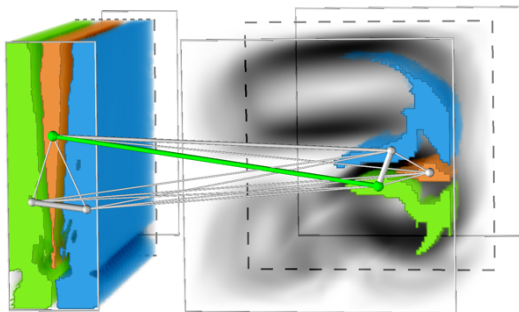
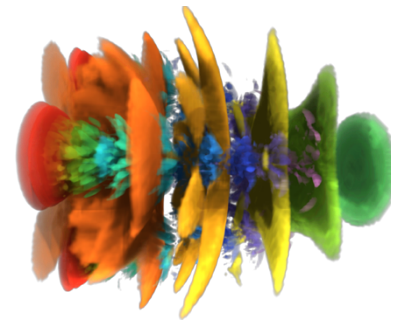
# Multifield Visualization

Prof Dr. Thomas Ertl – Dr. Steffen Frey – WS 2017/18

Visualization and visual analysis are fundamental for presenting, investigating, and exploring scientific data from measurements and simulation. Typically, data is not just represented as an individual field (i.e., a single distribution of one quantity), but rather consists of multiple fields. Data may be

- **time-dependent** (changing over time),
- **multi-variate** (featuring different attributes like temperature or pressure),
- **multi-modal** (stemming from different sources like simulations or measurements),
- **ensemble** data (repeatedly generated with varied settings, e.g., parameter studies),
- and **coupled** (obtained via coupled models, e.g., for multiphysics simulations).

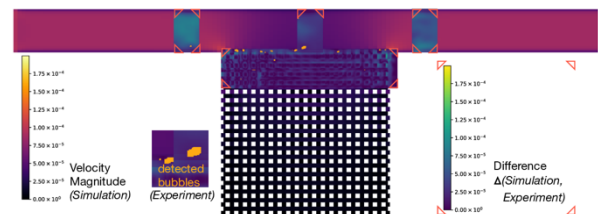
Also, data can be of different dimensionality or structured on different grid types that need to be combined in the visualization. This heterogeneity presents various opportunities as well as technical challenges for visualization research. Visualization and interaction techniques are thus often supplemented with computational analysis.



In this advanced seminar, we will discuss methods for visualization and interactive visual analysis of multifield data, covering a wide range of application domains, including climate research, geology, and astronomy. All texts will preferably be written in English; working language for the seminar is English.

Topics include:

- **visual mapping** (glyphs, multi-volume rendering, illustrative techniques, ...)
- **interactive visual analysis** (navigation, focus + context, brushing and linking, ...)
- **computational analysis** (aggregation, clustering, machine learning, ...)



**Target Audience:** MSc Informatik, MSc Softwaretechnik, MSc Computer Science/Visual Computing

**Prerequisites:** successful completion of a seminar is required (or a comparable course where a talk has been given); previous participation in the “Scientific Visualization” lecture is desired (but not mandatory)

**Contact:** steffen.frey@visus.uni-stuttgart.de ; gleb.tkachev@visus.uni-stuttgart.de