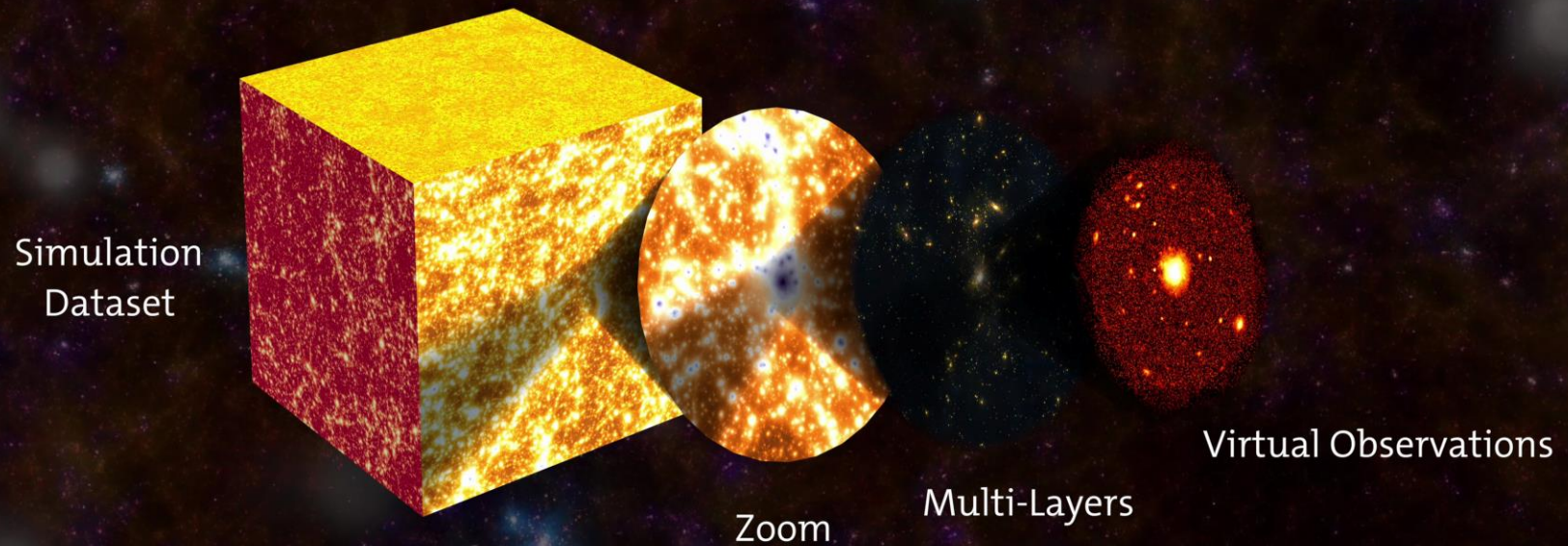


# A web portal for hydrodynamical, cosmological simulations

- Klaus Dolag, Universitäts Sternwarte München, LMU



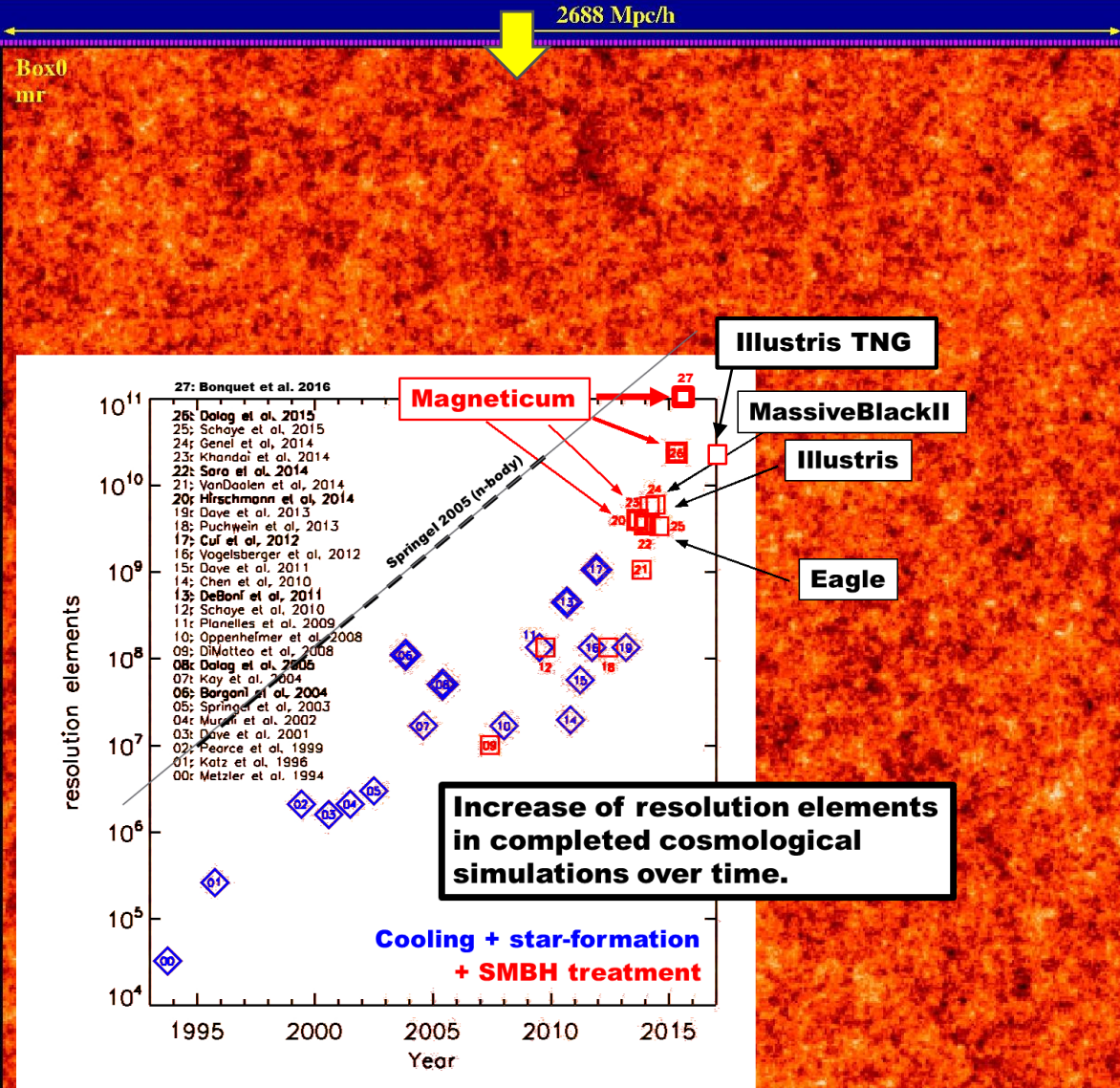
Work with simulation data of the universe  
*to create different views for analysis*

**Ragagnin, Dolag, Biffi, Cadolle Bel, Hammer, Krukau, Petkova & Steinborn 2017, A&C, 20, 52**



# Cosmology

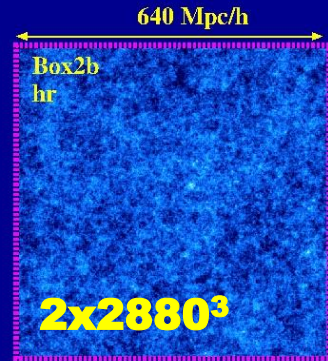
# Halos, BHs



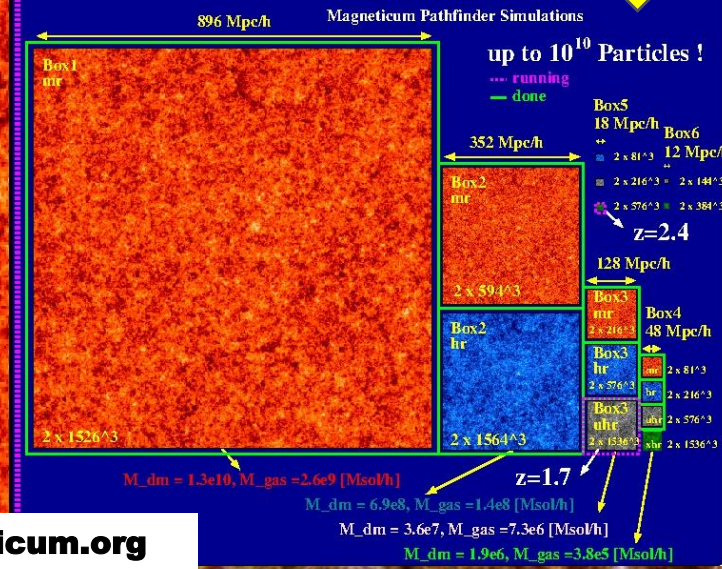
2x4536<sup>3</sup>

## Magneticum Simulations

up to 10<sup>11</sup> Particles !

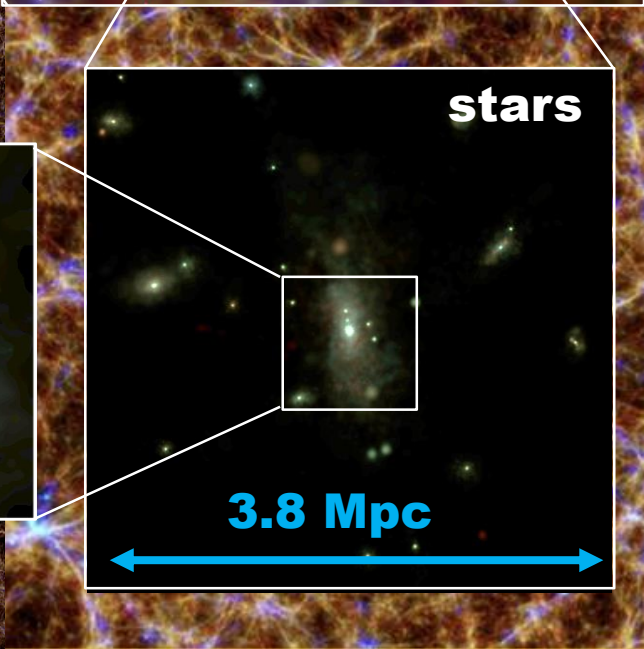
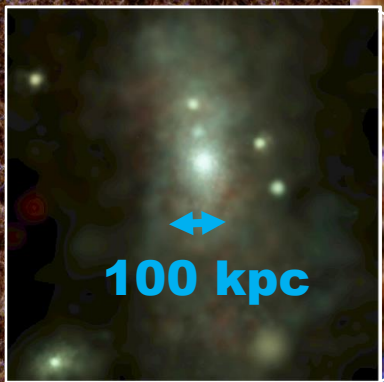
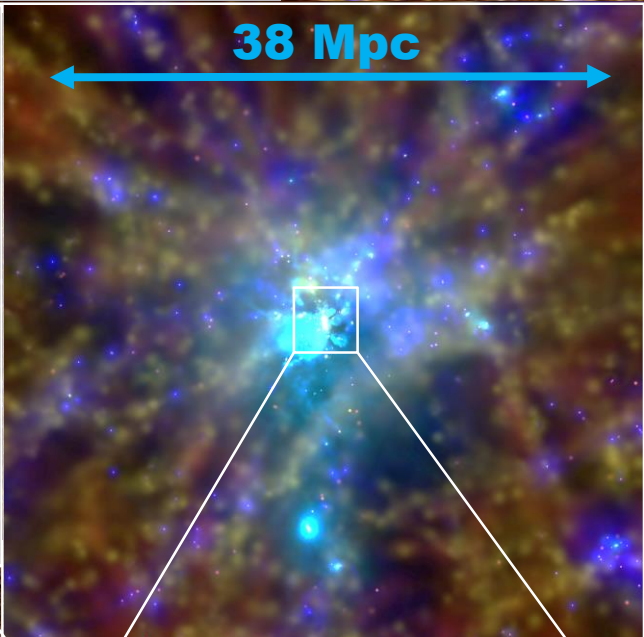
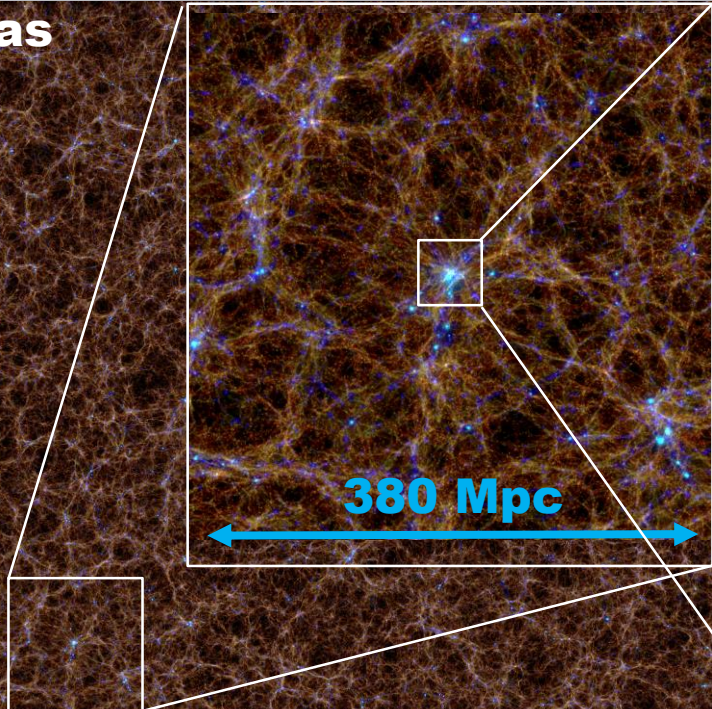
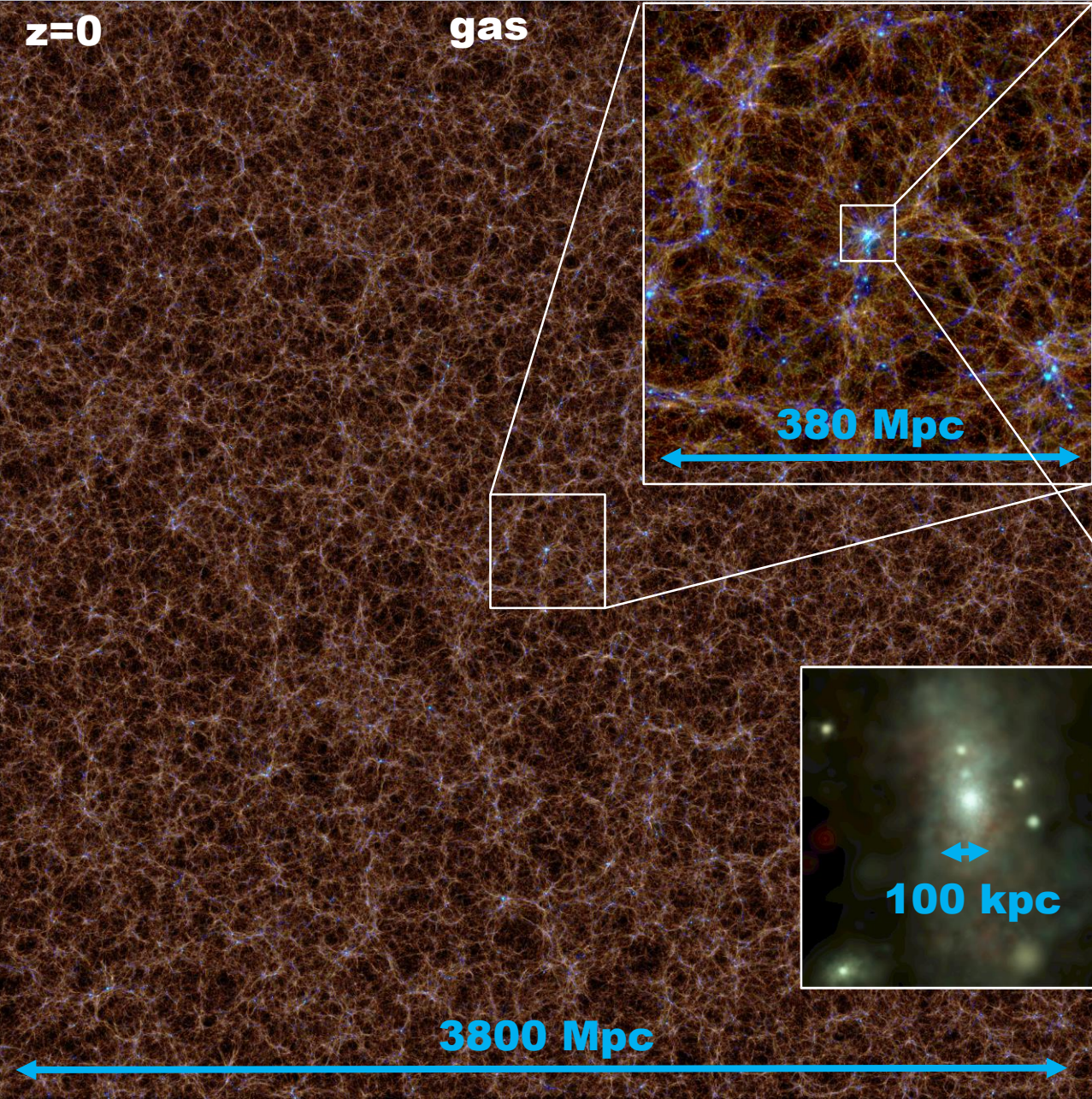
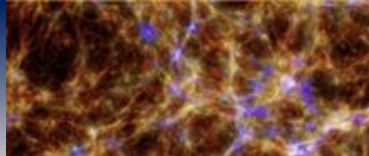


Galaxies





# Large Dynamical Range ...





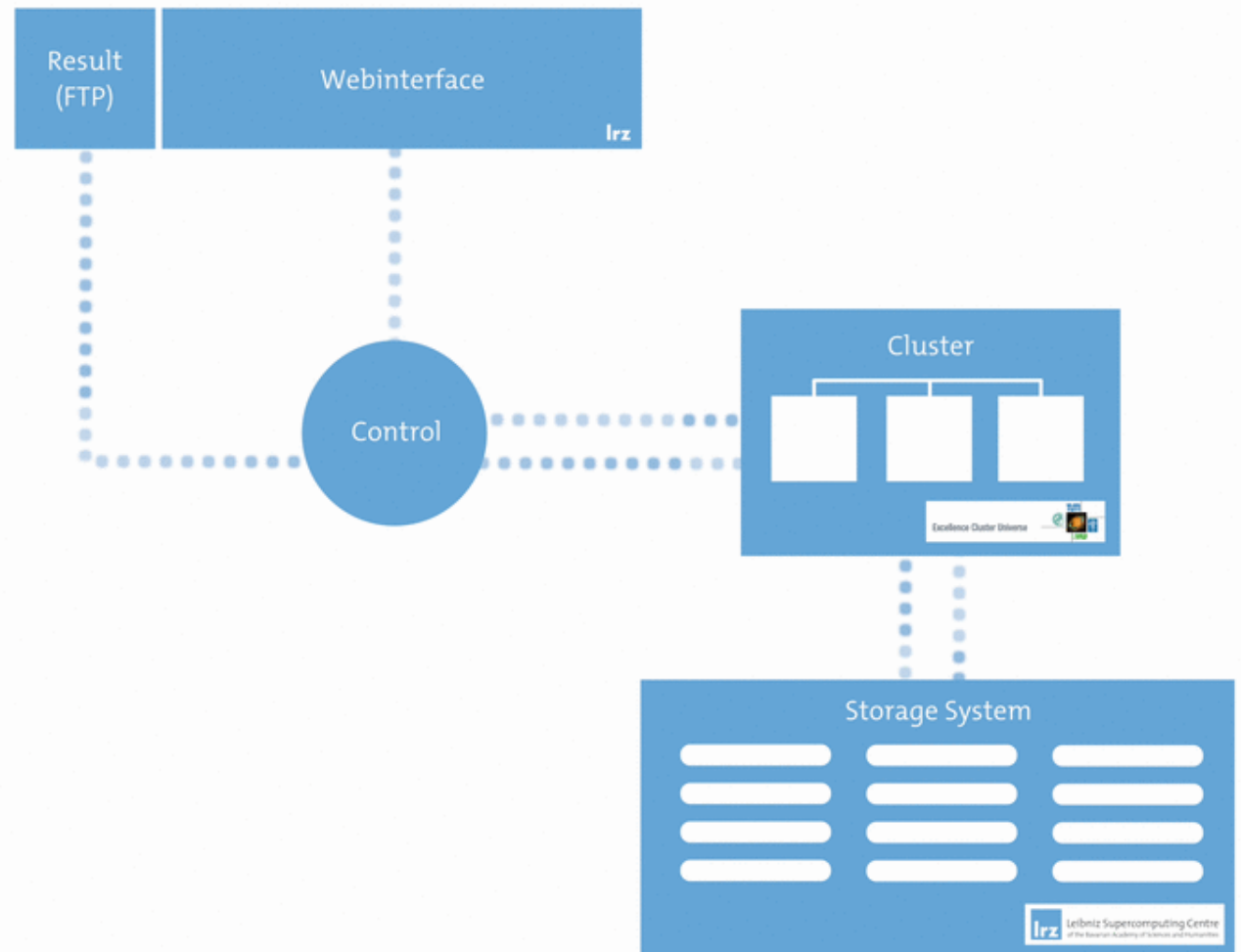
# Layout of the Web Portal

Ragagnin et al. 2017

Web Portal

Job Control &  
Compute Layer

HPC  
Storage



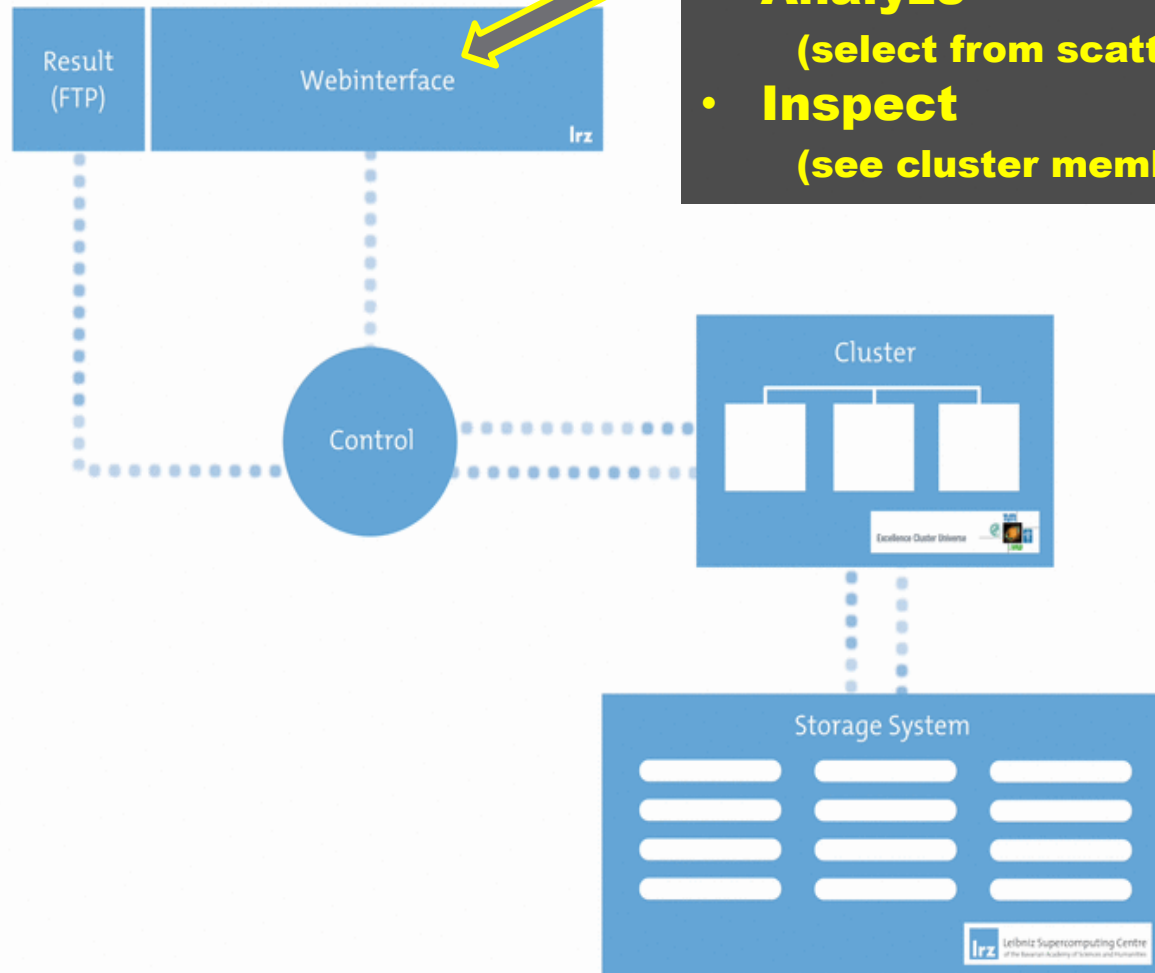
# Layout of the Web Portal

Ragagnin et al. 2017

Web Portal

Job Control &  
Compute Layer

HPC  
Storage



- **Browse Simulations**  
(select from image)
- **Restrict**  
(select from table)
- **Analyze**  
(select from scatter plots)
- **Inspect**  
(see cluster members)

# Layout of the Web Portal

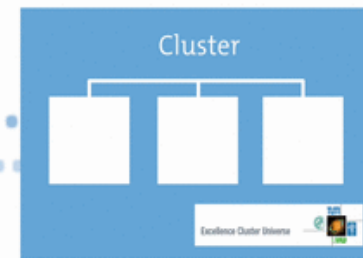
Ragagnin et al. 2017

Web Portal

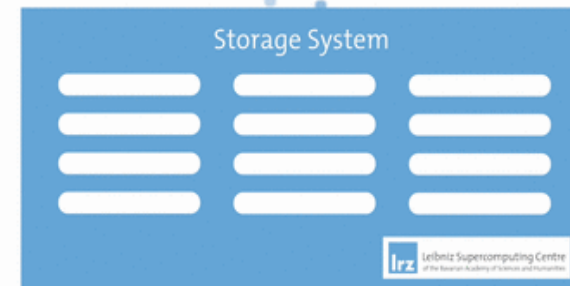
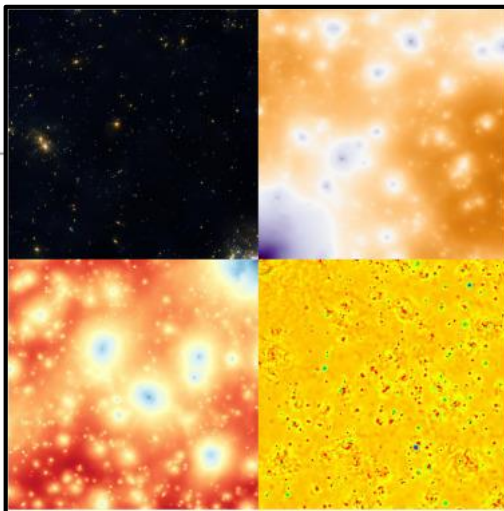


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Job Control & Compute Layer



HPC Storage





# Layout of the Web Portal

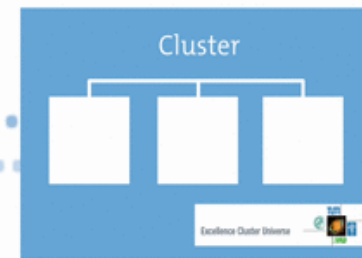
Ragagnin et al. 2017

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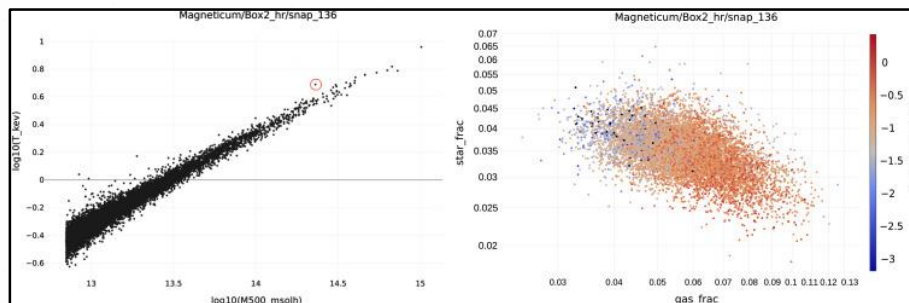
Web Portal



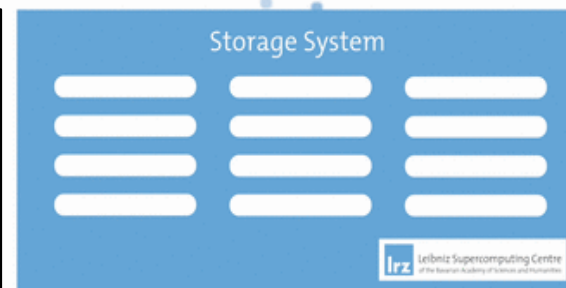
Job Control & Compute Layer



HPC Storage



Storage System



# Layout of the Web Portal

Ragagnin et al. 2017

- **Create Maps**  
(various quantities)
- **Simulate X-Ray**  
(various instruments)
- **Extract Simulation**  
(receive full hydro data)

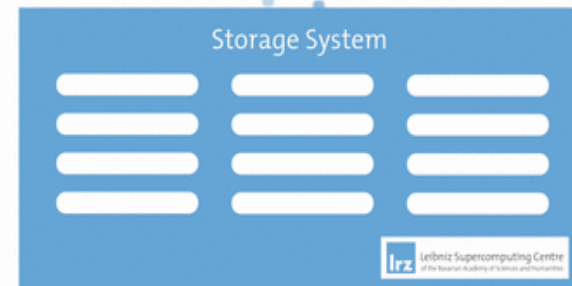
Web Portal



Job Control & Compute Layer



HPC Storage





# Layout of the Web Portal

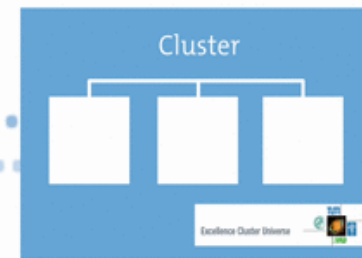
Ragagnin et al. 2017

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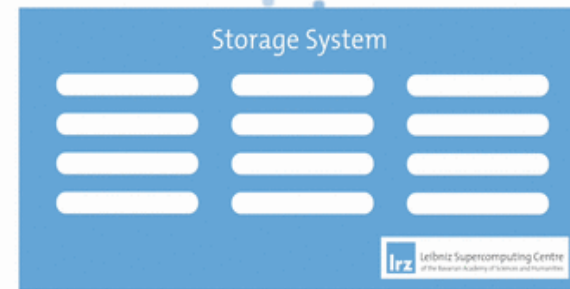
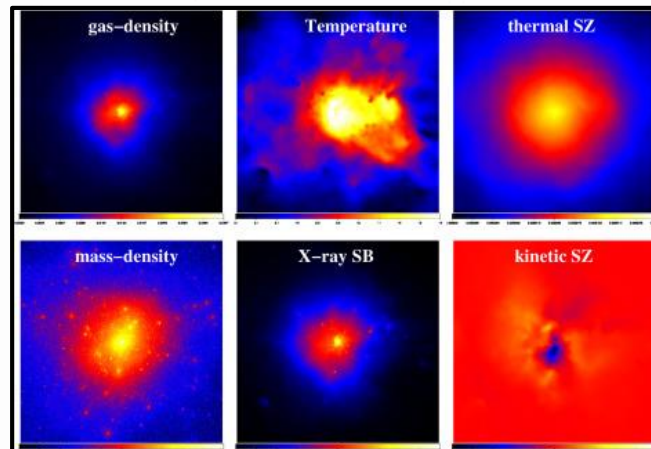
Web Portal



Job Control & Compute Layer



HPC Storage



# Layout of the Web Portal

Ragagnin et al. 2017

- **Create Maps**  
(various quantities)
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(various instruments)
- **Extract Simulation**  
(receive full hydro data)

Web Portal

Result  
(FTP)

Webinterface

lrz

Job Control &  
Compute Layer

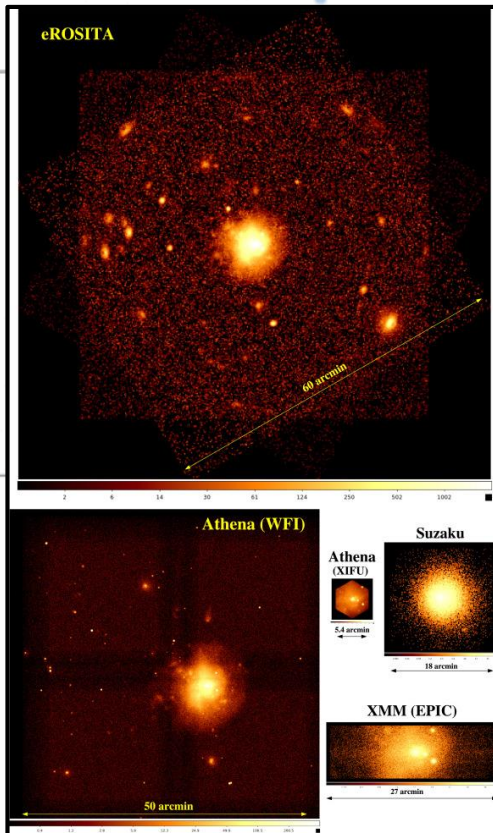
Control

Cluster

Excellence Cluster Ulmeria

HPC  
Storage

Storage System





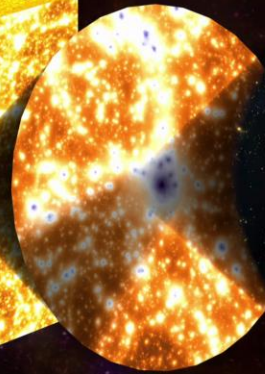
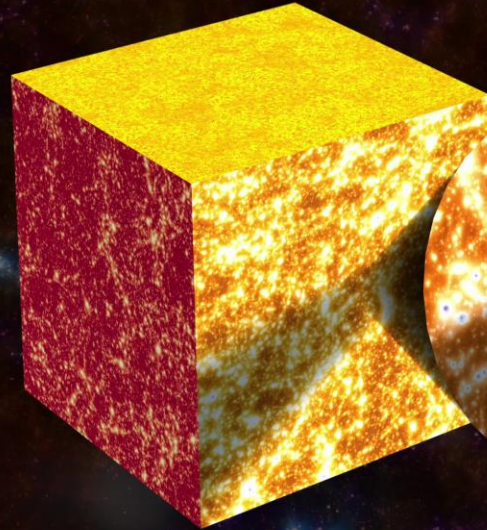


**Demo**



[www.magneticum.org](http://www.magneticum.org)  
[c2papcosmosim.srv.lrz.de](http://c2papcosmosim.srv.lrz.de)

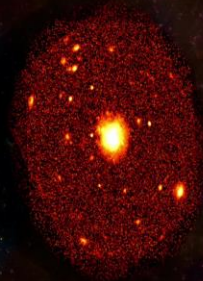
Simulation  
Dataset



Zoom



Multi-Layers



Virtual Observations

Work with simulation data of the universe  
*to create different views for analysis*