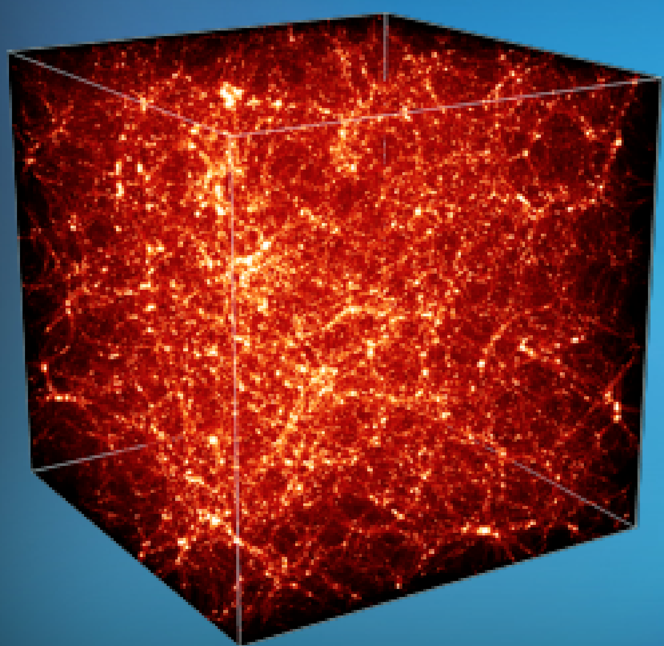
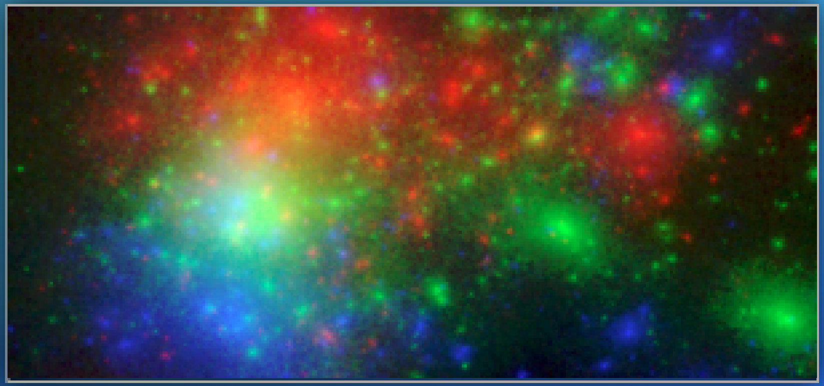


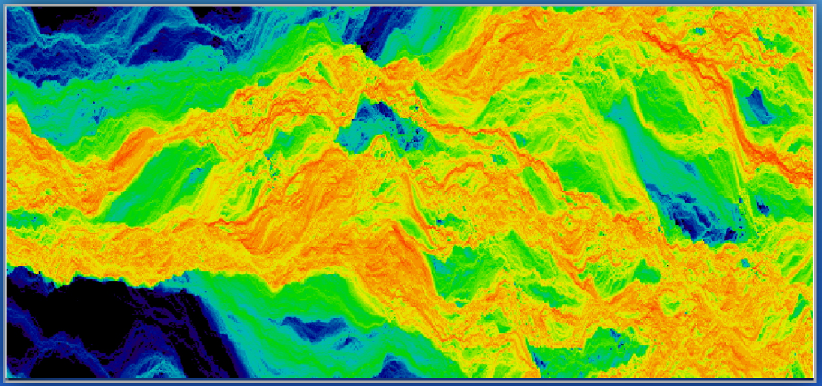
SimDB Implementation at VO-Paris Datacenter

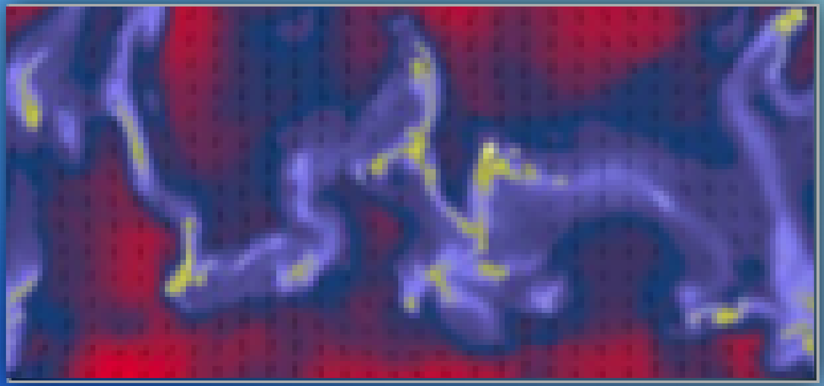
Benjamin Ooghe, Franck Le Petit

Nicolas Moreau, Jonathan Normand, Laurent Bourgès

LERMA - LUTH - VO-Paris Datacentre



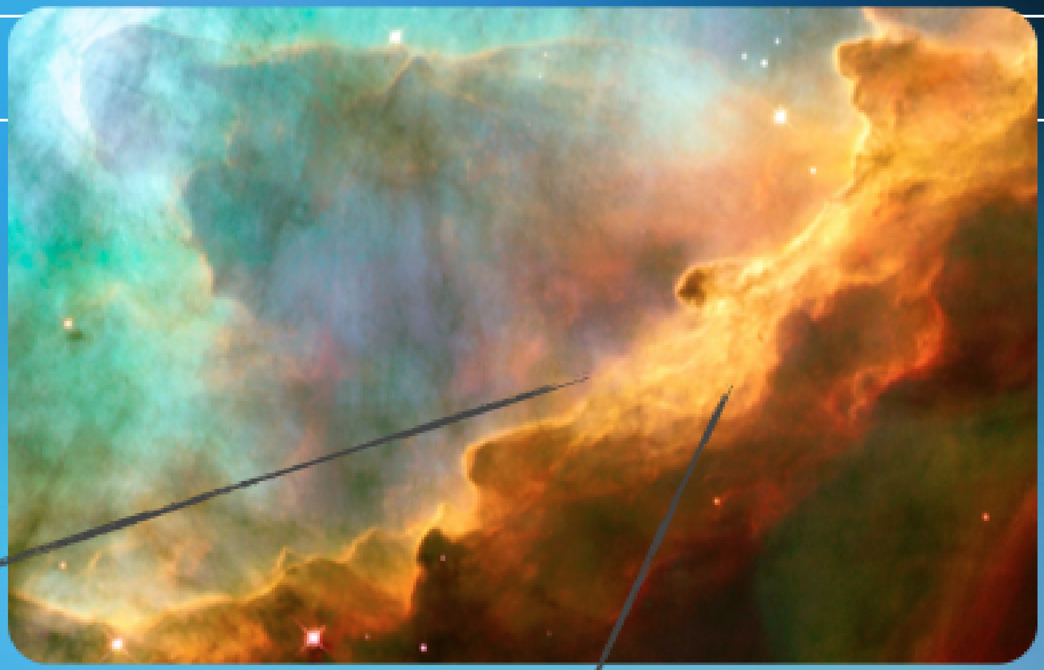


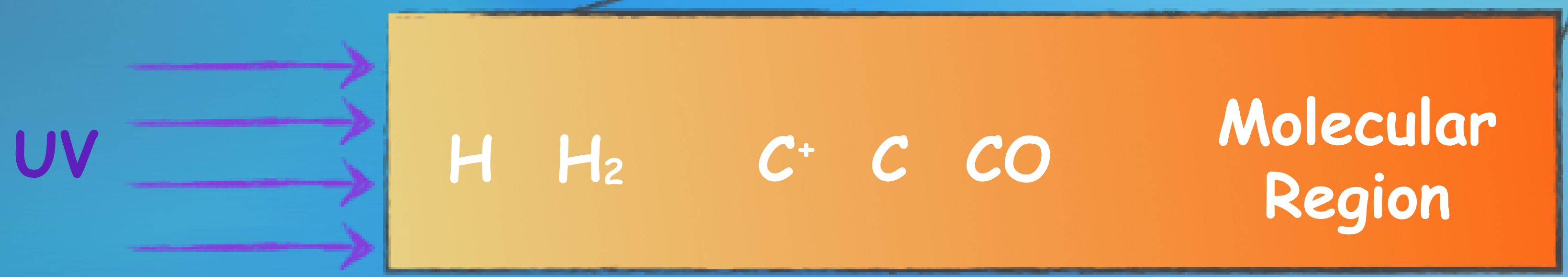


PDR Database - Photodissociation regions

Computes the chemical and physical structure of interstellar gas at stationnary state

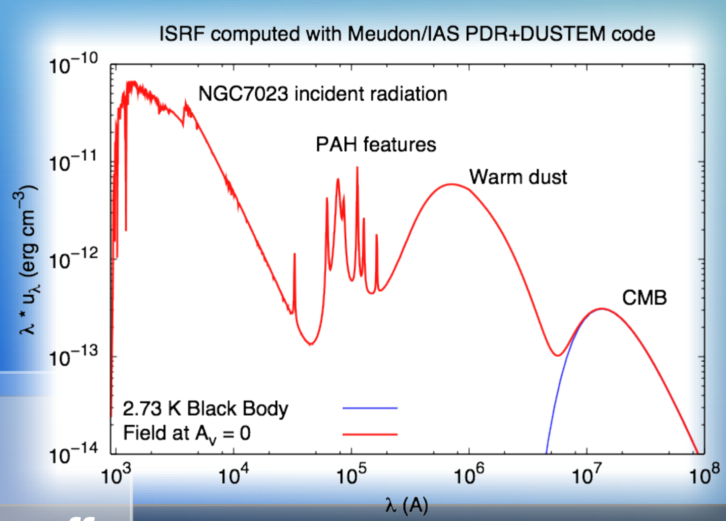
- Radiative transfer (FUV - sub-mm)
- Chemistry
- Thermal processes
- Statistical equilibrium in levels





Outputs

- Molecules abundance profiles
- Gas and grains temperature
- Levels excitation
- ...
- Line intensities
- Column densities

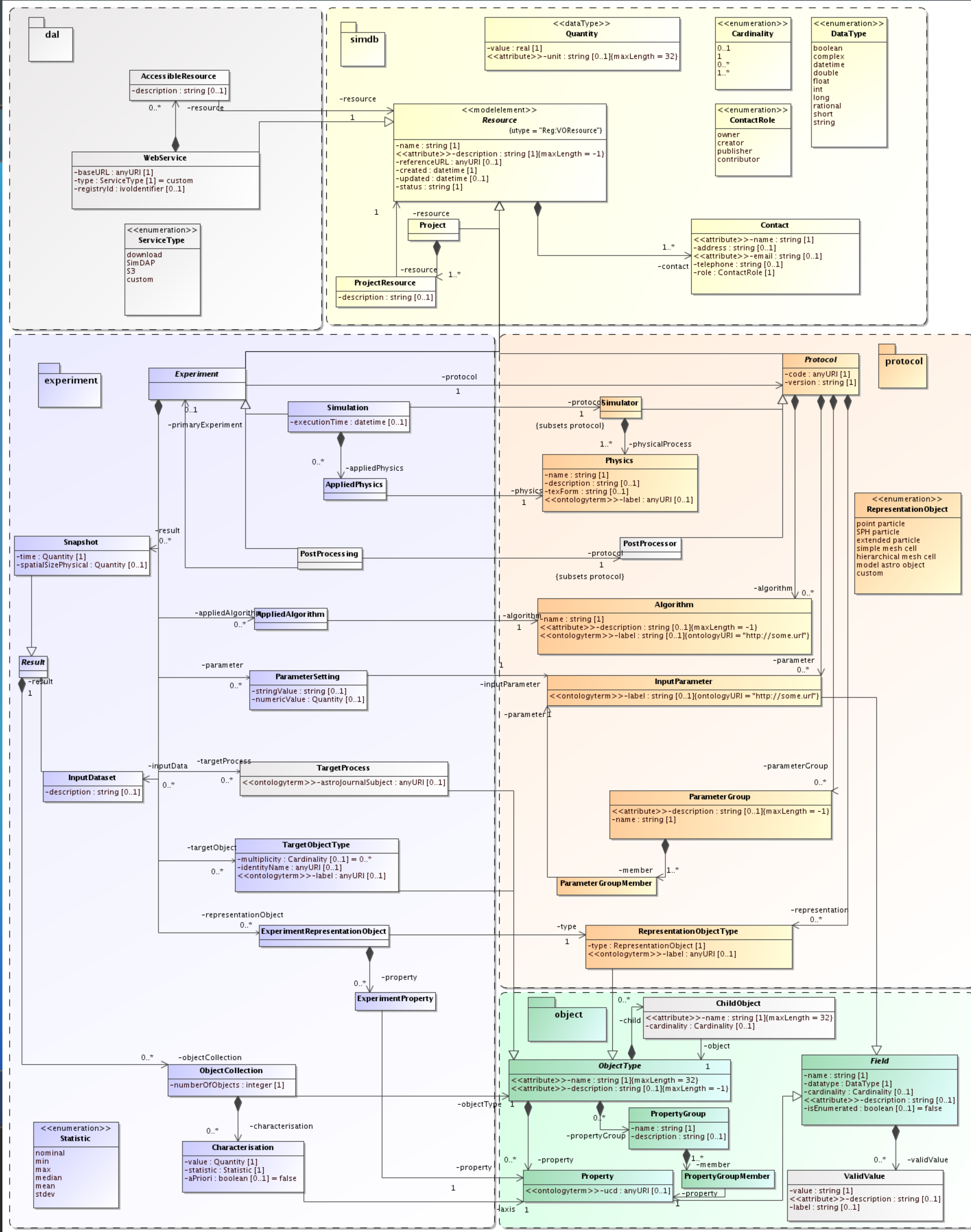


Website : **http://pdr.obspm.fr**

Authors :

Scientists: J. Le Bourlot, F. Le Petit, E. Roueff

VO-services: L. Bourges, N. Moreau, B. Ooghe, F. Roy, J. Normand



VO-Paris Datacentre

STARFORMAT - MHD simulations of dense cores

Goal : Share MHD simulations of ISM
Interpretation of HERSCHEL and ALMA observations

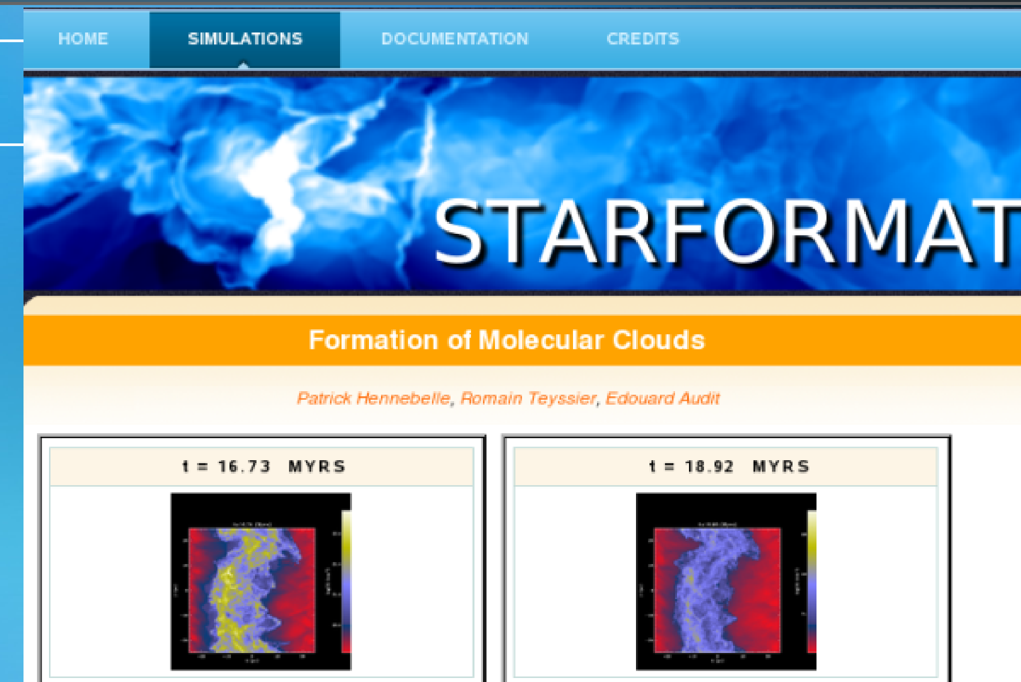
Services provide:

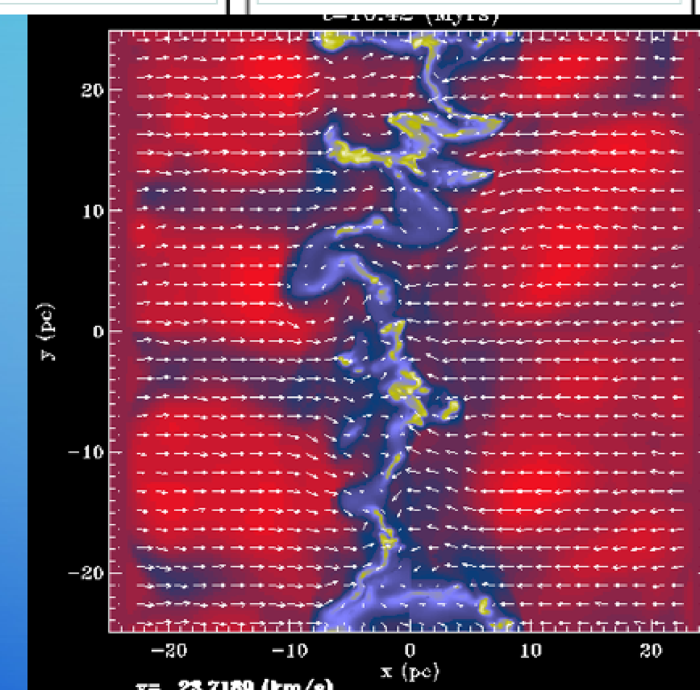
1) Full description (parameters, physics, …) of Simulations classified by projects

2) A selection of snapshots with descriptions : images, statistics, properties of lines of sight (density, velocity, ...)

3) Dense cores extracted from snapshots wih full description of each clump (images + properties)

4) Webservices to extract raw images or cubes from outputs



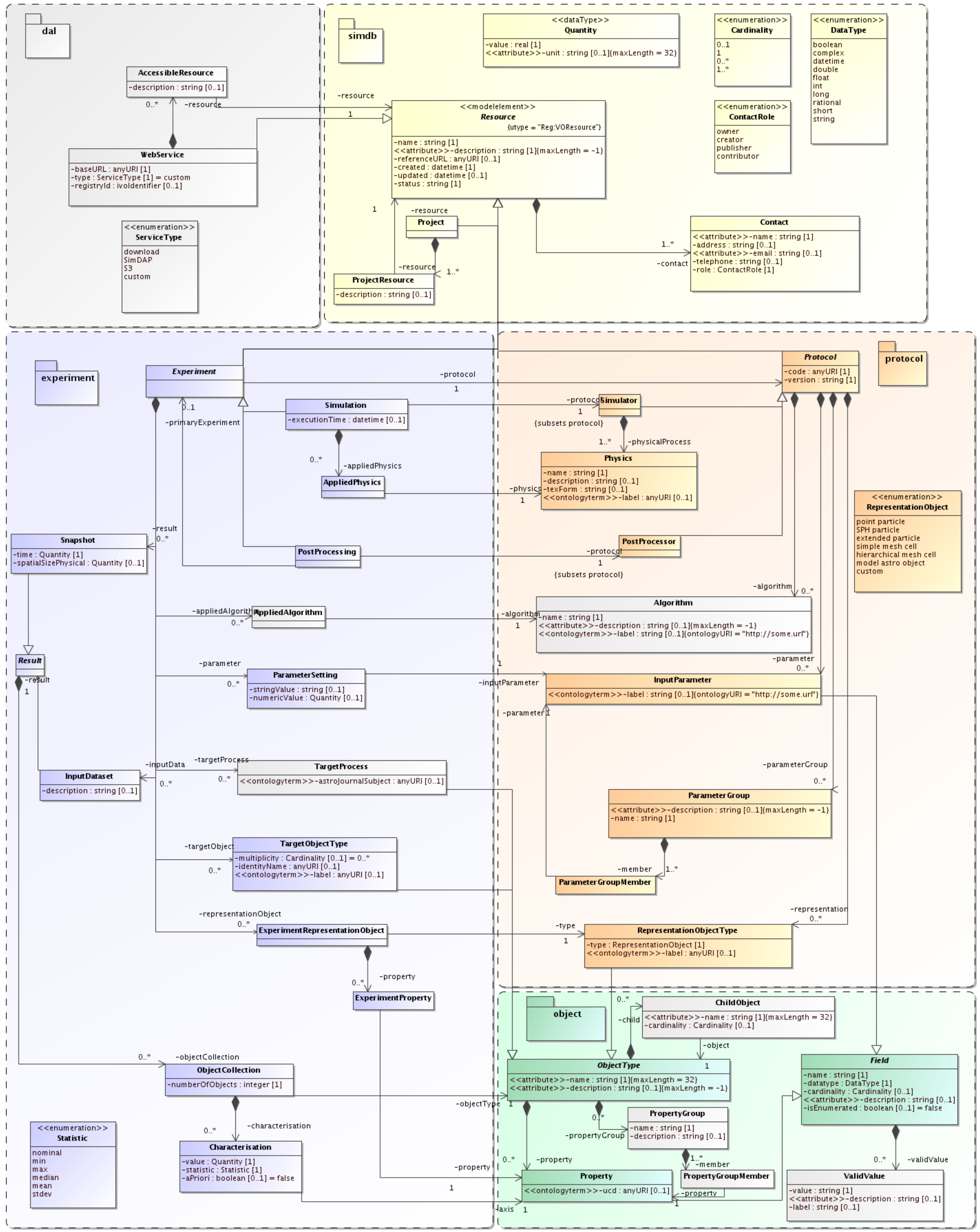


Website : **http://starformat.obspm.fr**

Authors :

Scientists : P. Hennebelle, R. Benerjee, R. Klessen, S. Glover, F. Le Petit

VO-services : B. Ooghe, N. Moreau



VO-Paris Datacentre

The implementation of SimDM for these VO services relies on VO-URP :

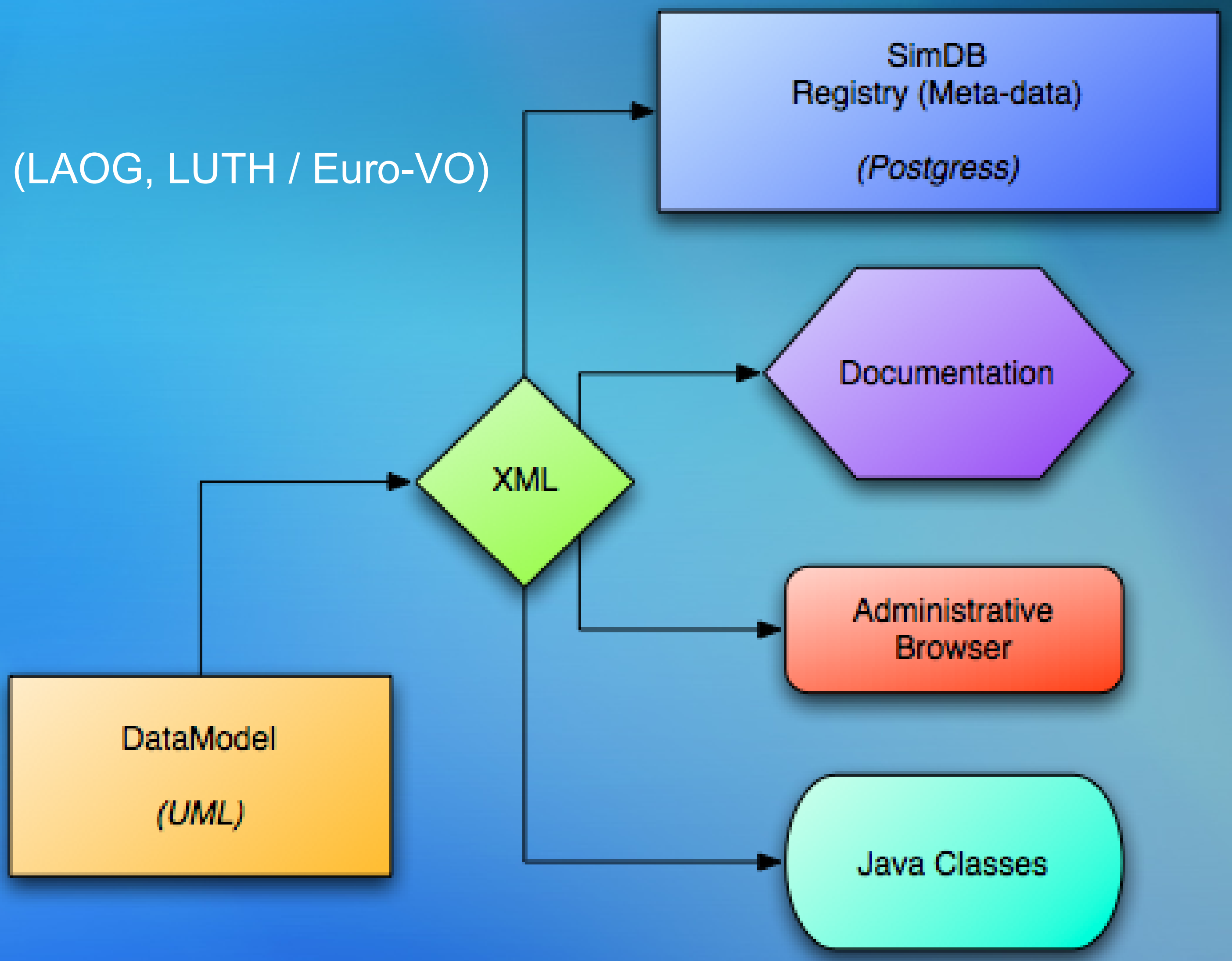
SimDB / VO-URP - G. Lemson (MPe) & L. Bourges (LAOG, LUTH / Euro-VO)

→ DataModel UML

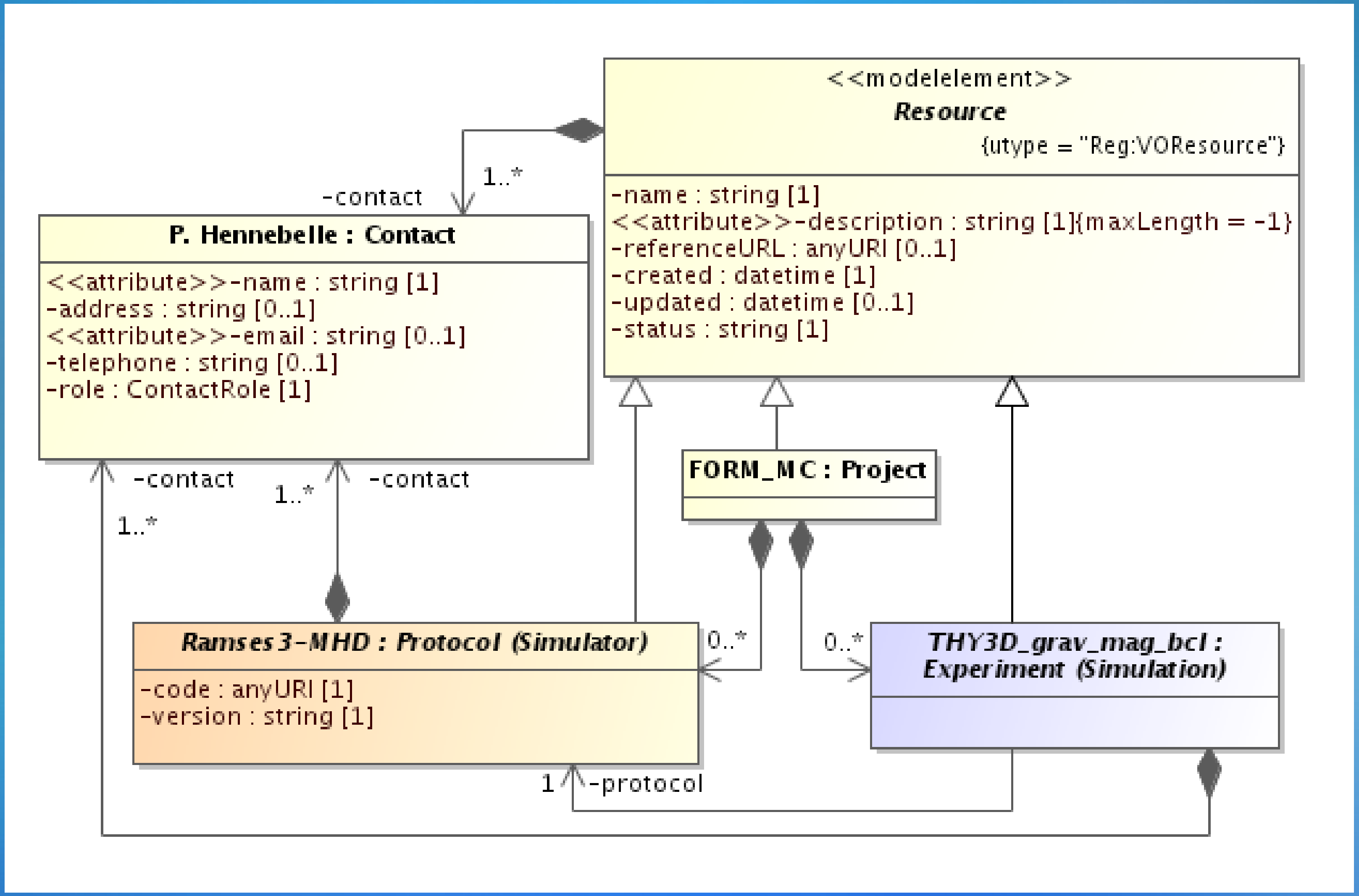
→ DB managing (PostGresSQL)

→ Java interface

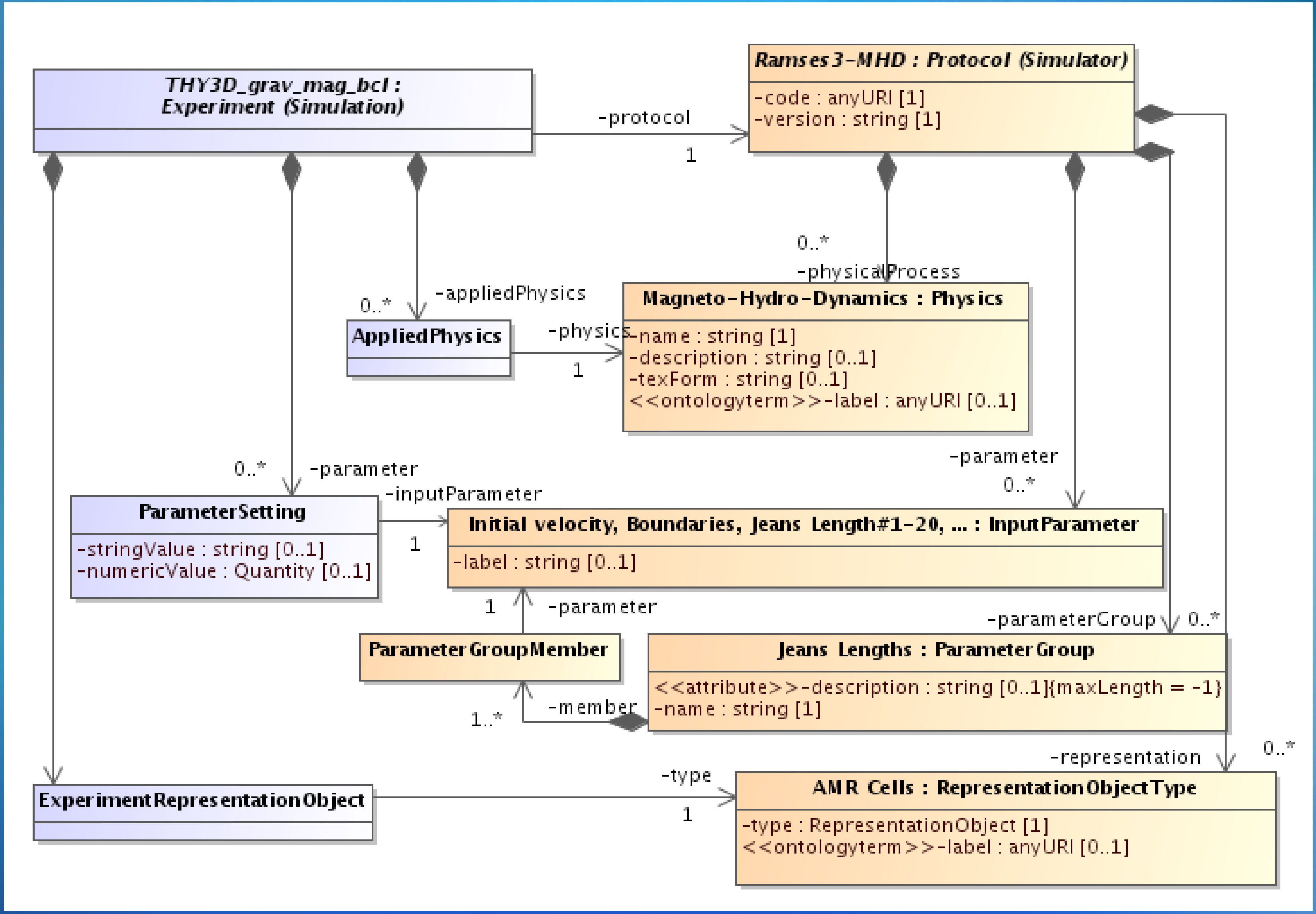
→ Web-tools: browser, loader, editor



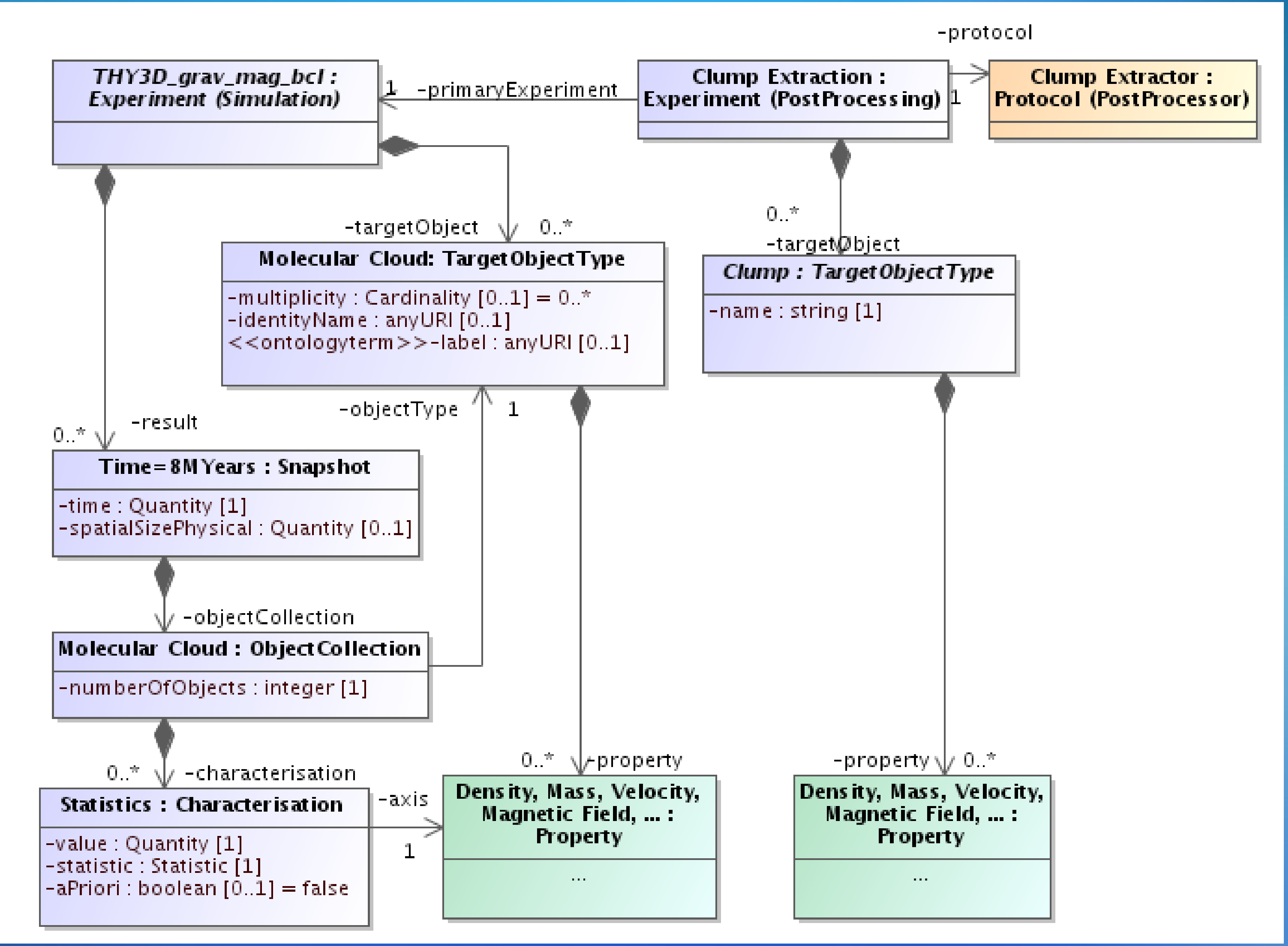
StarFormat examples of instantiation : Projects



StarFormat examples of instantiation : Simulations and Codes



StarFormat examples of instantiation : Snapshots, Results & Statistics



StarFormat VS. PDR : Uses of SimDM classes

	PDR	StarFormat
Project	Diffuse Clouds, PDRs, Extragalactic Clouds	Molecular Clouds, Dense cores, Turbulence
Protocol	PDR 1.4 – Chemistry10 PDR 1.4 – Drcnosd	Ramses-MHD 2 & 3 FLASH, ZEUS, ...
InputParameter	Density, Flux, Cosmic Rays, ...	Resolution, Initial density, ...
PhysicalProcess	Radiative Transfer, Molecular Cooling, ...	MHD, Gravitation, ...
RepresentationObject	Gas, Grains	AMR cells
TargetObject	Interstellar cloud	Molecular cloud, Cores
Result	Single result (stationary)	Snapshot (time iteration)
Product	Property sets, spectra, ...	Statistics sets, Images,
Property + StatisticalSummary	On RepresentationObjectTypes : Abundance H, H2, … Gas temperatures, …	On RepresentationObjectTypes : n/a
	On TargetObjectTypes : Column densities H, H2, … Line intensities	On TargetObjectTypes : Statistics on: Temperature, mass, density, …
PropertyGroup	Abundances, Column densities	n/a
PostProcessing	n/a	Clump extractions
TargetObject	n/a	Clump
Property	n/a	On TargetObjectTypes : Temperature, Mass, Density

Conclusion

Abstraction of the model allows good genericity

Very different datasets can fit in the same registry

- Micro-physics simulations (PDR : queries by input parameters or inverse problem)
- MHD simulations
- Large scales simulations

Depth of the model allows good adaptability

Theory projects evolve constantly and can be updated easily

Very different kind of queries can be used for each science app

But still need of individual human work per project :

Adapt ingestion process by mapping data to the model

Adapt web interface to display results in accordance with specificities of each scientific project