

# LMDZ - Planets

Some specificities about the planetary  
atmospheres GCMS

LMDZ courses, December 10, 2019

# Overview of available GCM

- **Mars** => Derived from LMDZ3
- **Venus** => Derived from LMDZ4
- **Generic** => Derived from Mars GCM, for Exoplanets or Gas giants or even Earth
- **Titan** => First derived from Venus, but now from the Generic GCM
- **Pluto/Triton** (no really integrated with the rest)  
=> derived from the Generic GCM

# Generalized planetary GCMs framework

- Share the same dynamics LMDZ.COMMON, and now also DYNAMICO (for Generic and Venus physics, Mars soon) and WRF.
- Importance of a **clean physics/dynamics** separation to handle switching from a dynamics or physic package to another => see **libf**

# Planetary GCMs test cases (1)

- Download the install scripts from:  
<http://www.lmd.jussieu.fr/~lmdz/planets/>
- Like `install_lmdz.sh`, these scripts (`install_*.bash`) download the required NetCDF library, install it, download the model, compile it (as well as the IOIPSL library), download a testcase and run it.
- Look for the **documentation** in `LMDZ.*/**` and the trac : <http://web.lmd.jussieu.fr/trac-planeto>
- Check out the `*.def` files

# Planetary GCMs test cases (2)

- Redo some extended simulations (change `nday` in `run.def`) and select outputs in `diagfi.nc` using a `diagfi.def` file. Also check out the `stats.nc` output.
- Adapt the `arch` files to compile in MPI (see the LMDZ model tutorial, very straightforward to adapt to planetary GCMs) and learn to run using “`mpirun`”
- Play with `start2archive` and `newstart` to change resolution