Laboratoire de Météorologie Dynamique

The Laboratoire de Météorologie Dynamique mainly studies climate, pollution and the atmosphere of planets using both theoretical approaches, instrumental development for observation and numerical modelisation. It is a leader on the research about dynamical and physical processes to study and forecast the meteorological and climatic phenomena.

The Laboratoire de Météorologie Dynamique is a joint research unit whose main supervisory authorities are Ecole Nationale Supérieure, University Pierre et Marie Curie, Ecole Polytechnique and French National Center for Scientific Research (CNRS). The laboratory has strong relation with the French national space centre (CNES). He is located at three sites (at Ecole Polytechnique in Palaiseau, at Ecole Normale Supérieure and at University Pierre et Marie Curie, in Paris). Less than 200 persons work at LMD, including one quarter of permanent researchers and teachers, one quarter of engineers and administratives, one quarter of doctoral students, and one quarter of post-doct or visiting researchers.

Research Themes

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LMD is working in two main axes: **study of the climate change and of the anthropic effects and study of dynamical and physical processes in fluid envelopes and at the surface.**

The laboratory studies the dynamic of the atmosphere mainly at the global scale; but to understand and forecast the atmospheric processes it deals with smaller scales, always mixing modelling, theoretical studies, observations and experimentations.

The LMD is structured in seven scientific teams plus the administrative team, an informatics? group and a technical pole to deal with instrumental development:

- « Atmosphère-Biosphère-Climatologie (télédétection) » for the study of water vapour and CO_2 fluxes using in situ measurement and satellite data;
- « Cycle de l'eau et de l'énergie dans les Tropiques|» to exploit geostationary satellites mainly

Meteosat and to prepare the Megha-Tropiques mission;
- « Fluides stratifiés et tournants » is busy with the climate dynamic, the stratosphere, the turbulence and the balloon experiments;
- « Interfaces et troposphère » is focus on physic and chemistry of the atmosphere, and on the aerosols and clouds;
- « Modélisation globale et changement climatique » develops physical parametrisations for LMDz the atmospheric component of the IPSL Earth?s model, and studies the natural variability of climate and the impacts of human activities on it;
- « Planétologie » works on the atmospheres of Mars, Venus, Titan, Triton and Pluton ;
- « Variabilité du Climat et Prédictabilité » to study dynamical systems, data assimilation, predictability, ocean and atmosphere coupling and paleo-climates.

Main international projects

LMD is being engaged in major international climate projects, among others :

- AMMA : African Monsoon Multidisciplinary Analysis
- IPCC
- HYMEX
- MACC
- Megha-Tropiques : study of water cycle in the tropics
- STRATEOLE

Collaborations

They are strong with the others laboratories of the Institut Pierre Simon Laplace and also with Météo-France and nearly all the French laboratories dealing with atmosphere.

There are also specific relations with Laboratoire de Physique de l'Atmosphère et de l'Océan - S Fongang (LPAO-SF) in Dakar and with institutions from India and Argentina.

Tools / instrumental developments

- Climate and global atmospheric circulation modeling
- Modeling and observation of water balance
- Modeling of planetary atmospheres (Mars, Venus, Titan)
- Process models, chemistry transport linkages
- Design, development and construction of instruments on board satellite (ScaRaB radiometer), airborne (WIND Doppler lidar for measuring wind field) or insitu (lidar to measure the CO_2 fluxes).
- Development of instruments embarked on board ballons (measure of water vapor, aerosols ...) and participation in experimental campaigns (INDOEX, BOA, AMMA, STRATEOLE, CONCORDIASI...).

Management team

Director : Philippe Drobinski (philippe.drobinski@lmd.polytechnique.fr)

Deputy directors :

Riwal Plougoven (riwal.plougonven@lmd.polytechnique.fr)

François Forget (francois.forget@lmd.jussieu.fr)

Fabio d'Andrea (dandrea@lmd.ens.fr)

Contacts

Access to **LMD website**