IPSL – Institut Pierre Simon Laplace - gathers 9 laboratories in the Paris area whose research topics concern the global environment and which develop a common strategy for the study of the Earth System as a whole

- Study dynamical, chemical and biological processes in oceans and atmosphere
- Study exchanges of matter and energy between atmosphere, oceans and biosphere
- Understand the water and carbon cycles
- Understand natural climate variability at regional and global scales
- Study, predict the impacts of human activities on atmosphere, ocean and climate
- Predict climate at seasonal and inter-annual scales and at the end of the century
IPSL observes the state of our planet

IPSL seeks to detect climate and environment changes and variations at all spatial scales either from space or from ground, particularly at ground bases part of international networks

CALIPSO satellite, launched in April 2006, is part of the satellite constellation A-Train, a platform dedicated to study the climatology of clouds and aerosols.

Since 1978, the Ozone hole is continuously monitored from space.

Ices cores are witnesses of climate change. This one was extracted by EPICA drilling at the Concordia base in Antarctica.
IPSL scientists organize international multidisciplinary in situ observation campaigns to understand key processes and interactions between different components of the environment (atmosphere, ocean, ice, land surfaces, land use).

In 2012, the HyMeX campaign aimed at improving the forecasting of hydro-meteorological hazards which cause serious damages in the Mediterranean area.

The CHARMEX campaign achieved a complete inventory of air pollution in the Mediterranean area in order to improve our understanding of the interactions between air pollution and climate.
The SIRTA atmospheric observatory is established since 1999 on the Polytechnique campus and hosts more than 150 instruments: active, passive, in-situ, remote-sensing, radar, lidar, sonar, radiometers, ...
In parallel with routine observations, SIRTA organizes dedicated measurements campaigns in partnership with French or foreign labs and private companies concerned by air quality and energy.

The ParisFog observation campaign was aimed at understanding the physical and chemical processes controlling the fog life cycle and its relations to climate change and land use.

Evaluation of photovoltaic potential at SIRTA

http://sirta.ipsl.polytechnique.fr
The IPSL ocean-atmosphere coupled numerical model evaluates potential climate changes for the 21st century. Its results were included in the international database used to develop the 5th IPCC report.

Climate evolution is computed within interacting small boxes.

Average summer temperatures in France observed and modelled by IPSL. The 2003 summer heat wave will be commonplace in 2050.

The results of the IPSL model in cases of two scenarios, a virtuous one (RCP2.6, left) and a large emitter of greenhouse gases (RCP8.5, right), at the end of the 21th century. For temperatures (above) and precipitations (below).
All data collected by IPSL, issued from field campaigns, observation networks or simulations, are stored in databases and made available to the international scientific community. The data are also open for operational applications such as climate services.

The IPSL database hosts all the IT resources needed for data treatment, analysis and storage.

IPSL participates in the Earth System Grid Federation (ESGF), an open-source software platform for the management and analysis of Earth Sciences data.
From the Earth to the Solar system

IPSL also studies the climate of terrestrial planets (Mars, Venus, Titan) as well as the origin of planets and of life (Mars, Titan, comets). The Institute participates in many planetary missions launched by the European, American, Japanese and Russian Space Agencies.

IPSL Global Climate Model accurately simulates the environment on other planets, like Mars, Pluto, Venus, Titan, Triton and extra-solar planets.

IPSL develops instruments to study the planetary atmospheres and to seek traces of past or present life in the ground;