The P’ institute is a research laboratory in the fields of Physics and Engineering Sciences for Materials, Mechanics, Energetics and Environment. Pprime is a research unit «Unité Propre de Recherche», of the CNRS (Centre National de la Recherche Scientifique, INSIS), the University of Poitiers (Faculty of Fundamental and Applied Sciences, Faculty of Sport Sciences and National Higher School of Engineers of Poitiers and the National Higher School of Mechanics and Aeroengineering, Ecole Nationale Supérieure de Mécanique et d’Aérotechnique (ISAE-ENSMA).

Its research activities cover a broad spectrum of topics including physics and mechanics of materials, fluid mechanics, energetics and mechanical engineering. This research relies on existing skills, recognized at the international level, that fosters collaborations and synergies between different disciplines, and thus provides an appropriate response to the rapidly evolving needs of the socioeconomic sector. This includes environmental research relevant to both transport and energy. The research activities of the Institute are primarily conducted within 38 000 m² of facilities located at Futuroscope-Chasseneuil (north of Poitiers), with additional facilities at the University Campus (east of the city), and at two other secondary locations in the cities of Angouleme and Niort. The technological center PROMETEE is now based near to Futuroscope-Chasseneuil too.

Keywords
Materials, thin films and nanostructured materials, physical defects and plasticity, damage and sustainability, hydrodynamics and environmental flows, aerodynamics, turbulence, and acoustic control, convection, transfer systems and optimization, electro-fluidodynamics, flame structure and turbulent combustion, nano-scale heat and radiation, porous media and heterogeneous combustion, detonation, lubricated mechanical interfaces, robotics and biomechanics, sports, health, and photomechanics and experimental analysis in solid mechanics.

The professional and research master’s degrees in the generic field of Science-Technology-Health are divided into two sections «Physics of Materials» and «Engineering Sciences» and several specialties.

Training of the doctoral students is performed through the Graduate School of Science and Engineering in Materials, Mechanics, Aerospace Engineering and Energetics (MMEA-IF)

COLLABORATIONS: Strong partnership with leading national and international groups as SAFRAN (SNECMA, Turbomeca, Hispano-Suiza, Aérospatiale, SAGEM), EADS (AIRBUS), CNES, ESA, PSA, RENAULT, EDF, SAGEM, SAINT GOBAIN,...
Pprime is associated with the Pole of competitiveness Aerospace Valley, ASTech, MOVEO (automotive).
Research Focus

Department of Physics and Mechanics of Materials (D1): Studies of the relationships between microstructure, defects and physical and mechanical properties of materials.

Department of Fluids, Heat and Combustion (D2): A continuum in the study of flows and transfers associated with reactive or no reactive inert medium.

Department of Mechanical Engineering and Systems Complex (D3): Understanding the behaviour of complex systems through an integrated approach.

Annual scientific production of the Pprime Institute: 256 articles in international journals, 144 conference papers and other archived international publications.

3 books are edited per year on average. The Pprime Institute has a portfolio of 42 patent families of which 21 are shared with industry.

Pprime participates in research activities and national international programmes:
- 27 current programmes of the «Agence Nationale pour la Recherche» ANR
- 20 «Groupes de Recherche» from CNRS, including 4 in liability
- Two Industrial Chairs: CAPA et OPALE
- Member of the CNRT aerodynamics and aeroacoustics of terrestrial vehicles.
- Within the national Programme of «Investments for the future» in 2011 and 2012, Pprime has been the recipient of several long term grants (8 years) concerning: 3 EQUIPEX (Equipment of excellence) projects: EQUIPEX “NanomagesX”, national network for nanotomography studies on SOLEIL Synchrotron; 1 LABEX (Lab of excellence) programme “INTERACTIFS” supporting fundamental multidisciplinary approaches for solid/gas interfaces phenomena in complex systems.
- Pprime operates numerous European Programmes, and Specific international programmes favouring international exchanges and mobility.
- Pprime is a member of the France-Argentina CNRS Laboratory «Physics and Fluid Mechanics»
- 5 thesis co-directed with foreign universities
- 20 foreign visitors received per year.

Relations with the socio-economic domain: the Pprime Institute have more than 40 referenced partners, about 70 contracts per year for an average amount of 2.3 M€.

70% of the contract resources come from the sectors of Transport (including Aeronautics 36%, Automotive 19%, Space 9%), 20% from the Energy sector. The Institute is also involved in 15 programmes including Industry (FUI, ANR, EU) for an amount of 2.5 M€. The total contract resources of the Institute amount to 8.5 M€ per year on average.

The laboratory has the State Region Planning Contract whose average contribution is 1 M€.

Experimental facilities

The Pprime Institute has exceptional experimental means described in more detail in the presentations of each of the three departments and of the platform, namely:
- Banks for materials manufacturing: thin films and surface treatments, benches for material characterization, electron microscopy and X-ray, fatigue benches, mechanical testing under load and extreme temperature conditions of the PMM department,
- Hydrodynamic benches, aerodynamic and aeroacoustic wind tunnels, benches for combustion and detonation, thermal enclosures for FTC department.
- Sealing and lubrication benches, seals, tests of effort and humanoid robotics of the department GMSC.
- Parallel computing machine, 288 processing cores AMD, common to the tree departments.
- The Pprime Institute has also a technological platform, the CEAT, for large test facilities in Materials, Mechanics, Combustion, Aero-acoustics and supersonic wind tunnels, sealing benches etc., most being based on high pressure air production and storage (200 atm.).