PROMES is a Research Unit of the National Centre for Scientific Research, depending on the Institute for Engineering and Systems Sciences (INSIS-CNRS); it is also linked by an agreement to the University of Perpignan (UPVD). The laboratory is located in three sites: Odeillo-Font Romeu (CNRS Solar furnaces), Targasonne (central receiver solar facility in Thémis site owned by the 'Pyrénées Orientales' Council/CD66) and Perpignan (Tecnosud business zone). The staff of PROMES is about 150 employees, working in 8 research groups and 7 technical/administrative departments. The main research fields are 'materials under extreme conditions' and 'conversion, storage and transport of solar energy'. PROMES is leading or is involved in several European projects; it is also currently leading 2 important national projects: the 'laboratory of excellence' SOLSTICE (Solar Energy: Science, Technology and Innovation for Energy Conversion) and the 'equipment of excellence' SOCRATE (Concentrated solar energy, advanced researches and energy technologies). Since 2016, the solar facilities of PROMES in Odeillo and Targasonne have been identified by the French Ministry of higher education research and Innovation as the National Solar Thermal Research Infrastructure for Concentrated Solar Power under the acronym FR-SOLARIS.

- Access is offered to 12 high concentration solar furnaces, whose thermal power ranges from 1 to 1000 kW. Maximum solar concentration is as high as 16000 suns (16 MW/m^2) for the **MSSFs**, and 10000 suns for the **MWSF**, which is exceptional and allows temperature reaching nearly 4000°C. The maximum power available at the focal point (spot diameter as large as 80 cm) of the big solar furnace MWSF is 1 MW, which allows world unique high temperature pilot-scale experiments. All the solar furnaces are equipped to accurately modulate power and flux density over wide ranges and very high dynamic control. This allows to perform repeatable heating cycles, including with fast controlled temperature variations (> 1000°C/s). Numerous setups are available for tests under air, vacuum or controlled atmosphere, most with complex instrumentation such as in situ-characterization of chemical composition.
- The pilot trough parabolic plant (**MicroSol'R**) has 2 orientations of the collectors (E-W and N-S) for testing of collector tubes with thermal oil. It is equipped with two kinds of thermal storage systems including a thermocline, a loop for steam generation and an ORC turbine to produce electricity. This research infrastructure has high flexibility of its 3 heat loops with extensive instrumentation (temperature, flow, pressure), allowing for e.g. the test of new materials for solar absorption, tests of materials for thermal energy storage, or tests of thermodynamic converters and assessing their efficiency.
- The 5MW **Themis** solar tower plant is one of the rare facilities of this size available for research and development purposes up to the prototype scale. It is particularly suitable for research on high temperature solar plants (800-1400°C), allowing the test of next generation solar processes as well as innovative cycles. Its availability has been extended by creating a second stage suitable for pilot size experiments (power up to 500 kWth).

A large spectrum of research areas is supported, either at high temperature (up to 4000°C) and/or high flux (up to 16 MW/m^2), from fundamental researches to industrial developments, such as: electricity production, thermochemistry (e.g. solar fuels), physics (e.g. radiation heat transfer & fluid flow), solar metallurgy and high temperature materials synthesis or characterization (e.g. aerospace, automotive, solar receivers, nuclear reactors…), photophysics (e.g. high concentration PV, thermoionic conversion…), biology (e.g. bioreactors, water treatment…), industrial heat, etc.

Services currently offered by the infrastructure:

The CNRS-PROMES (FR-SOLARIS) infrastructure allows to carry out any research or development activity under low to high solar radiation (up to 16 MW/m^2) and low to high temperatures (up to 4000°C), thanks to its facilities and the existing setups: various chambers, automated robots and extensive instrumentation, both in-situ or in laboratory for specialized rare material properties characterisations. Such capability has allowed to work on solar energy harvesting (several electricity production processes, solar fuels production such as hydrogen, metals or biomass derived, solar energy storage, industrial heat, solar upgrade of industrial processes such as concrete production…), space shields testing (several NASA and ESA probes), coatings synthesis for automotive motors, nanomaterials research for electronic components and also hydrogen storage, metallic foams production. These activities are carried out from lab-scale to industrial prototype scale thanks to the wide range of available facilities within the RI.

As of 2018, the infrastructure currently hosts 3 European RTD projects about solar energy conversion (SolPART, Next-CST and POLYPHEM), after have many other such as CSP2 or Solhycarb, or contracts such as Solar2Zinc (CH) or with ESA and NASA (USA). During the previous SFERA-II programme (FP7, 2014-2017), 94 different users mostly European used our solar facilities through the trans-national access for 49 projects, these figures being similar to those observed during the SFERA-I (FP7, 2010-2014) or Solface (FP5, 2004-2007) and which covers 15 to 20% of the total operation time of the facilities.