

SIRFN Capability Summary

LAAS-CNRS

Introduction

The LAAS-CNRS new challenges deals with information, communication and energy sciences and technologies. For over a few years now, a fully novel, very challenging and transversal experimental multidisciplinary project, called ADREAM, has been launched.

It consists of two parts, a research programme, supported by a set of tools and projects, and an experimental building, able to support a real design and evaluation of these systems.

This will be done in many advanced areas, such as embedded systems, networks sensors, Internet of things, machine-to-machine communication, software services, companion robots, security and privacy, production and optimisation of the energy.

The research programme of this very ambitious, challenging and multidisciplinary project has been complemented by the definition and the construction of a new unique experimental implementation and evaluation platform.

Note also that the building, the support platform, has been defined to represent what might be our workplaces, and therefore our living places, in the next ten years.

The project has been proposed and the platform built in the framework of the French Contrat de Projets État-Région 2007-2013, with the support of the French State, of the Région Midi-Pyrénées, of the EU through the FEDER programme, of the Grand Toulouse Urban Community, of CNRS and LAAS-CNRS.

For more information, contact:

Name: Michel Diaz
Title: Director of Research
E-mail: Michel.Diaz@laas.fr
Phone: +33561336256

Name: Christelle Ecrepont
Title: Technical Engineer
E-mail: Christelle.Ecrepont@laas.fr
Phone: +33561336215



Website URL: <http://www.laas.fr/>

Renewable Energy and DER Integration

Desired Level of SIRFN Participation: 3

- 1 = Low 2 = Med 3 = High

Description of Activities

Unique in Europe, the platform today in particular includes:

- a photovoltaic energy production system, with inverters, sensors, a system for storing energy, and lab benches connected to the photovoltaic panels for power generation.

More generally, the energy-related facilities include:

- a front wall made of bi-glass and tri-glass photovoltaic modules
- an experimental characterisation terrace equipped with tiltable solar panels
- a roof with solar panels fixed and tilted at 10 C degrees
- a weather station
- a buffer gallery, located behind the front photovoltaic wall, and equipped with an air circuit of adiabatic free-cooling type
- an exchanger connected to a 5 m deep Canadian well
- three geothermal heat pumps, connected to 18 geothermal probes of 100 m depth.

The platform delivers 100 KWp of photovoltaic energy. Finally, the laboratory will provide part of the researchers and of the technicians who are needed for the users to carry out their achievements.

SIRFN Site Focus Area Lead(s):

Name: Corinne Alonso
Title : Professor
E-mail: Corinne.Alonso@laas.fr
Phone: +335 61 33 69 42

Name: Bruno Estibals
Title : Professor
E-mail: Bruno.Estibals@laas.fr
Phone: +335 61 33 62 08



Website URL: <http://www.laas.fr/ADREAM/>

SIRFN Subtask 2.2

Building Automation

Desired Level of SIRFN Participation: ?

- 1 = Low 2 = Med 3 = High

Description of Activities

Describe activities in this subtask area with an emphasis on nature of research/testing. Include relevant information on current clients/customers and highlight any unusual capabilities, major accomplishments or relationships.

SIRFN Site Focus Area Lead(s):

Name

Title

E-mail:

Phone:

Name

Title

E-mail:

Phone:

Area for photos, diagrams
or other graphic material.

SIRFN Subtask 2.3

PEV Integration

Desired Level of SIRFN Participation: ?

- 1 = Low 2 = Med 3 = High

Description of Activities

Describe activities in this subtask area with an emphasis on nature of research/testing. Include relevant information on current clients/customers and highlight any unusual capabilities, major accomplishments or relationships.

SIRFN Site Focus Area Lead(s):

Name

Title

E-mail:

Phone:

Name

Title

E-mail:

Phone:

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Website URL: <http://>

Microgrids

Desired Level of SIRFN Participation: 3

- 1 = Low 2 = Med 3 = High

Description of Activities

LAAS will work on the design, implementation and evaluation of the micro-mini Smart Grid defined by the new building platform.

The platform will be used by LAAS-CNRS and its partners to illustrate and validate the outputs of joint projects, i.e., by an association between the laboratory and the research organizations, public or private, that are partners in the projects.

The procedure in place for using the platform requests an application sent to the manager of this platform, which, with the help of an adequate scientific and technical committee, will assess the opportunity of the proposal, depending on the resources needed by the project and on the work and usages already underway on the platform.

The application will have to specify what is the use of the platform resources and what are the human resources to be provided by the users, i.e., the laboratory and its partners.

The cost will be defined by an agreement between the laboratory and its partners, based on the needed resources, the time of their use, and the involved supporting people.

SIRFN Site Focus Area Lead(s):

Name: Corinne Alonso

Title : Professor

E-mail: Corinne.Alonso@laas.fr

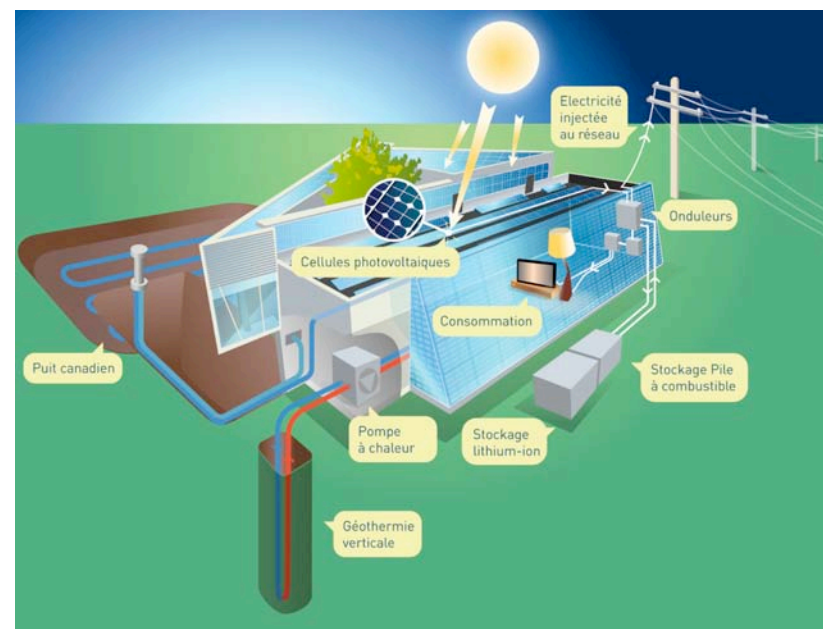
Phone: +335 61 33 69 42

Name: Bruno Estibals

Title : Professor

E-mail: Bruno.Estibals@laas.fr

Phone: +335 61 33 62 08



Website URL: <http://www.laas.fr/ADREAM/>

SIRFN Subtask 2.5

Distribution Automation

Desired Level of SIRFN Participation: ?

- 1 = Low 2 = Med 3 = High

Description of Activities

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SIRFN Site Focus Area Lead(s):

Name

Title

E-mail:

Phone:

Name

Title

E-mail:

Phone:

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SIRFN Subtask 2.6

Cybersecurity

Desired Level of SIRFN Participation: ?

- 1 = Low 2 = Med 3 = High

Description of Activities

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Title

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Phone:

Name

Title

E-mail:

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Summary of Capabilities for Simulation and Testing

AC and DC sources:

- Substitute your own appropriate headings. Provide bullets on capacity and specification of equipment available for simulation and testing.

Test Configurations:

- Provide summary bullets on configurability and test bed setups available.

Loads:

Storage:

Controls:

Area for photos, diagrams or other graphic material.

Summary of Capabilities for Data Acquisition and Analysis

Data Acquisition:

From a large set of sensors

1. embedded in the building, including in particular;
 - Electricity and lighting
 - Presence
 - Environment (wind, light, temperatures, ...)
 - Heating-Cooling-Ventilation
 - Energy production, storage, consumption
2. Added by the research projects
 - Intelligent Video Sensors
 - Proximity and distance
 - Sensors on robots
 - People behaviour
3. Measurements
 - Around 6000 measures,
 - Taken every 1 to 5 mn
 - Using many different local sensor networks

Test Configurations:

- To be defined

