



# Internet of Things

## The ADREAM Project

**Michel Diaz**  
**LAAS-CNRS**

**Internet of Things Day, LAAS-CNRS, October 21, 2008**



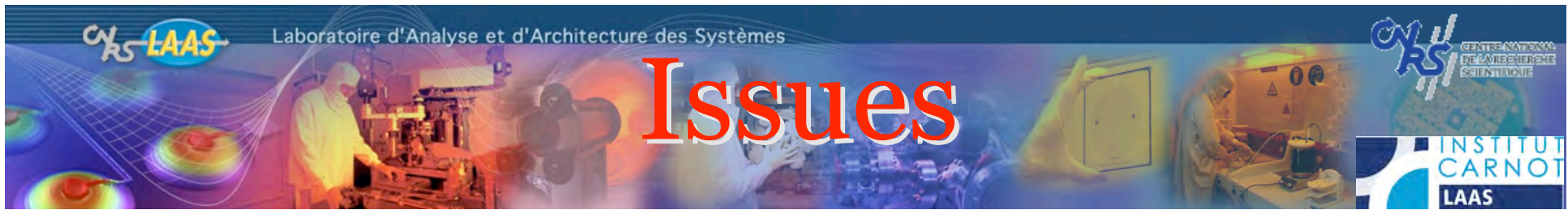
# ADREAM

**Architectures Dynamiques Reconfigurables  
pour Systèmes Embarqués Autonomes Mobiles**

**Reconfigurable and Dynamic Architectures  
for Mobile Autonomous Embedded Systems**



- **Launched in 2004 to prepare the massive interconnection of instrumented and intelligent autonomous sets of artefacts**
- **Using hierarchies of communicating wireless mobile cooperative sensor-actuator-processor systems: from embedded microsystems to networks of mobile robots**
  - **Research: communication, cognition, security, etc.**
  - **Experiments: developing significative trials**



- **Pervasive and Logical Intelligence, including sensorial and planning functions**
- **With Multi-level Interpretations and Decisions**
- **Issues :**
  - **Interactions, communication and networking**
  - **Heterogeneity and interoperability**
  - **Context adaptativity (and evolutivity)**
  - **Autonomy (for functions and decisions)**
  - **Energy optimisation**
  - **Resilience and security**
  - **Using model driven design (including validation)**



- ***TRANSCOM: Communication Systems with dynamique directionnel smart antennas***
  
- **Aim :**
  - **Networks of communicating Sensors and Objects** by optimising the software-hardware interoperability
    - reconfiguring antenna diagrammes
    - Providing basic network protocols
    - Minimising cell interferences and conflicts
  - **New services**
    - Localisation
    - High-Low throughput Reconfigurability on chip
    - Data-control plan Integration
    - **Cross-layering**



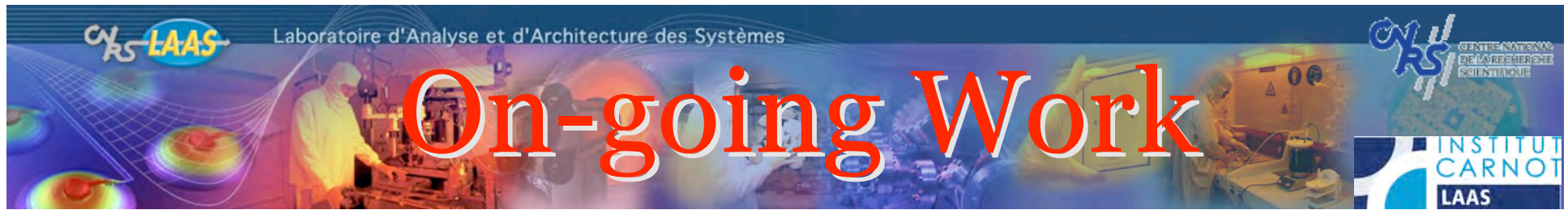
## ■ ***ROSEAU: Mobile and Cooperative Sensors, Robots and Humans Systems***

### ■ **Aim: Mobile Robots in**

- **Monitoring, exploration, or Surveillance tasks, while deploying the underlying needed communication system**
- **Locate and move sensors, actuators and equipments, and maintain the physical infrastructure and all inter-process communication**
- **Manage the software association, the decision procedures, and the human-robot communication whatever the dynamicity of the tasks**

**==> then, Communication**

- 1- new perceptive function of the robot, with hierarchical and quality constraints coming from the environment**
- 2- from high-level applicative primitives and decisions, to varying topologies and connexions**
- 3- leads to modifications of the planning in case of problems**



- **Develop three new platforms**
  - **Advanced Embedded Systems**
  - **QoS Networking**
  - **Design Environment**
- **To complement the three present platforms**
  - **Technology and Chip Design**
  - **Technology Characterisation**
  - **Robotics**



- **Proposing, buying and evaluating Methodologies and Design Tools**
- **Developing new System Architectures**
- **Start a new Instrumented Building**
- **The building is specifically being designed as a Strong Support for the trials**
  - **with sensors**
  - **with robots**
  - **parts of the instrumentation mechanisms**





**Thanks!**